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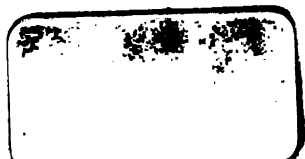
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THE

BRITISH

FARMER'S MAGAZINE.

NEW SERIES.

Agriculture not only gives riches to a nation, but the only riches she can call her own.—DR. JOHNSON:

VOL. XLVI.



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1864.

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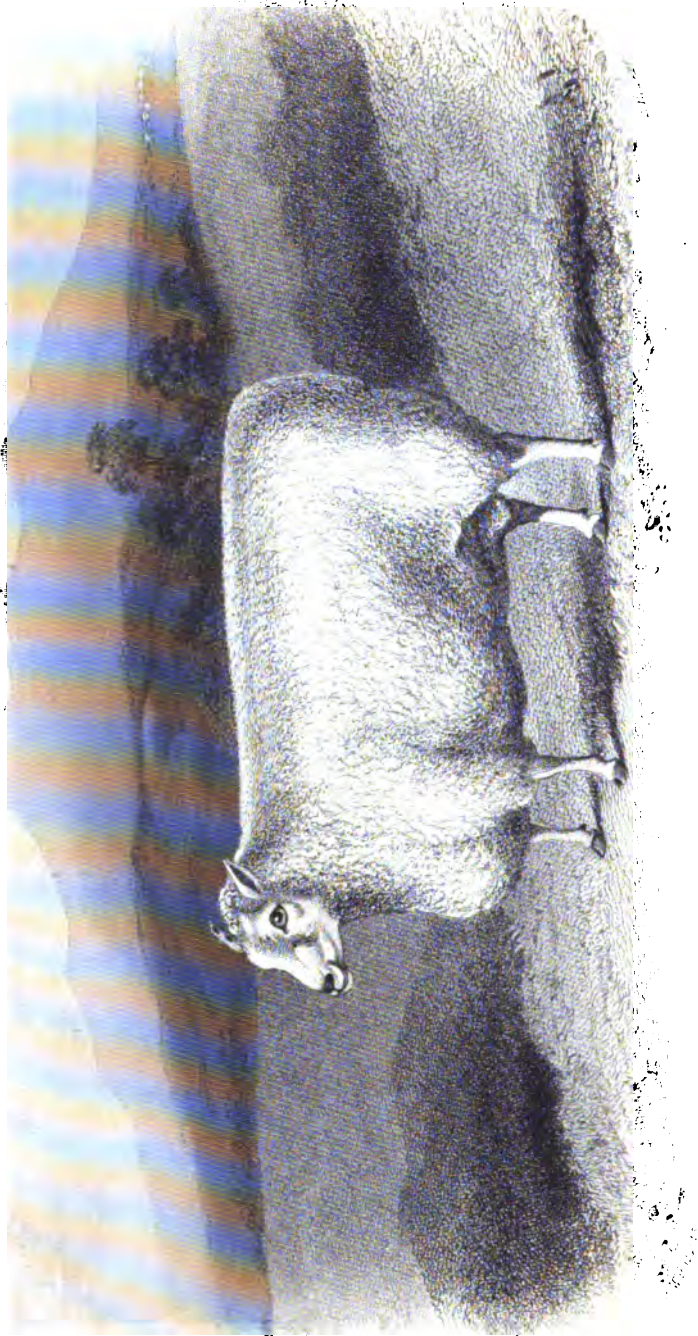
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Capra montana

The mountain goat is found in the high mountains of the Himalayas, and is a very hardy animal. It is a very common animal in the mountains of the Himalayas, and is a very hardy animal. It is a very common animal in the mountains of the Himalayas, and is a very hardy animal.



"Who There?"

Illustration by E. H. Jackson

THE BRITISH FARMER'S MAGAZINE.

NEW SERIES.

VOL. XLV.

1864.

NO. CX.

PLATE I.

BATTERSEA ROYAL: A PRIZE LINCOLN AND LEICESTER RAM.

THE PROPERTY OF MR. JOHN LYNN, OF CHURCH FARM, STROXTON.

This famous ram, bred by Mr. Lynn, is by a son of Mr. Sandy's 57-guinea sheep, the property of Mr. F. Spencer, out of Mr. Lynn's Silver Medal ewe of his own breed, and that took the medal in the extra class on the last occasion of the show being held in Baker Street—in 1861.

Battersea Royal in 1862 took the first prize of £15 as the best shearling ram in the Other Long-wool class at the Battersea Meeting of the Royal Agricultural Society; and in the same season the first prize of £10 at the Stamford Show of the Northamptonshire Society; with another first prize of £5, and the extra prize of £10 as the best ram of any age at the Leicester Meeting of the Sparkenhoe Farmers' Club. In 1863 he again took the first prize of £20 at the Worcester Meeting of the Royal Agricultural Society, and on all these four more famous occasions we met with Battersea in our travels. He has also, however, been as successful about home, but of these merely local doings we have no record. At Battersea Mr. Lynn took all the three prizes for shearling rams, and at Worcester he beat the Lincolns outright, with two first prizes and a second.

This Leicester and Lincoln cross, uniting as it does quality and symmetry with size, is very popular in certain districts; and at one of the Central

Farmers' Club discussions, a year or two since, when the subject turned on the growth of lustre wool, Mr. Ward, of Drayton, near Rockingham, said: "The difficulty which they had to deal with was in obtaining a proper soil for growing lustre wool. It seemed very extraordinary, but it was a fact, that long-wool might be produced from a district extending for 70 miles, and that after that it unavoidably became short. The Leicester and Lincoln sheep were almost the only sheep that could produce the kind of wool that Mr. Anderton thought they ought all to endeavour to produce. He must say that being in the habit of going into Lincolnshire in the spring, he found better sheep at the Lincoln fairs than anywhere else. Within the last three or four years he had seen three or four hundred tegs pitched in a pen and sold at three guineas a-piece. Many tegs in Lincolnshire weighed 14 stones, and some as much as 17 stones in April, when they were a year old. He himself had no particular breed; his sheep were Leicesters, and he touched them up slightly with the best Lincoln." Mr. Lynn is not merely known by his Long-wool sheep, as he has also a good Shorthorn herd; and one of his cows will be found credited in the present number with great things both at Birmingham and Islington.

PLATE II.

"WHO'S THERE?"

"Rabbits," says Johnson in one of his many and useful works on the dog and the gun, "are best confined to a warren, for they are a sad nuisance when numerous in the enclosures. They are not worth the sportman's attention, and are more destructive to the farmer than all other game put together."

This is well put any way, and perhaps there is no better plan for keeping down such a nuisance than a good hungry ferret and a quick terrier, as so beautifully depicted in Mr. Ansdell's moment of victory.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY COUNCIL: Wednesday, Dec. 2.—Present, Lord Feversham, President, in the Chair; Lord Chesham, Major-General the Hon. A. N. Hood, Mr. Acland, Mr. Raymond Barker, Mr. Bowly, Mr. Barthropp, Mr. Bramston, M.P., Colonel Challoner, Mr. Dent, M.P., Mr. Druce, Mr. Exall, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Hoskyns, Mr. Holland, M.P., Mr. Jonas, Mr. Lawes, Mr. Pain, Mr. Randell, Mr. Shuttleworth, Mr. Thompson, M.P., Mr. Torr, Mr. Wells, Mr. Frere, Professor Simonds, and Dr. Voelcker. The following new Members were elected:—

Boby, Robert, Bury St. Edmunds
Bowstead, Thomas, Eden Hall, Penrith
Champney, Felix, Gatwick, Crawley, Sussex
Duval, Fernand R., The Chateau de Marolles, Indre et Loire,
France

Eddowes, Thos. Henry, Pontesbury, Salop
Freeman, Thomas, 27, Millbank Street, London, S.W.
Gilbert, Robert, jun., Ashby Hall, Bergh Apton, Norfolk
Henderson, John, Horsley Hill, South Shields
Honywood, Mrs. Marks Hall, Kelvedon
Horncastle, Edwin, Edwinstowe, Ollerton, Notts.
Mynors, Robert, Weather Oak, Alvechurch, Worcestershire
Nicholson, James, Blencaira Hall, Penrith
Riddell, Henry P. A. Buchanan Maidstone.
Rodgett, Miles, West Cliffe, Preston, Lancashire
Smith, William Arthur, Colebrook Park, Taunbridge
Tate, John, Bilton Alawick
Tretthewy, Alfred Hugh, Bickling, Aylesham, Norfolk
Waddilove, G. M. D., Brnton, Hexham
Wall, George Young, jun., 39, North Bailey, Durham
Waller, John Anthony, Brinkburn House, South Shields
Wallis, Robert, Old Ridley, Stocksfield, Northumberland
Wing, William, Market Overton, Oakham.

FINANCES.—The Hon. Major-General Hood presented the report, from which it appeared that the Secretary's receipts during the past month had been examined and found correct. The balance in the hands of the bankers on the 30th November was £1,599 9s. 11d. The Country Meeting account for Worcester was laid on the table. The Committee recommended that the names of 20 members in arrear from various causes be struck off the list of the Society; this report was adopted.

JOURNAL.—Mr. Thompson, M.P., reported that in Class VIII. (1863, Miscellaneous Essays) no prize is awarded, but No. 334 will be published in the Journal by arrangement with the author.—*Worcester Local Prizes for Essays:* When the essays competing for these prizes were sent in, the Journal Committee resolved to appoint one judge for each class on the part of the Society, and to invite the Worcester Local Committee to appoint another. Two applications made to the Worcester Committee with this object have, however, received no reply, and the Journal Committee now propose to appoint a second Judge for each class in the usual manner. This report was received and adopted.

CHEMICAL.—Mr. Wren Hoskyns presented the report, which was ordered by the Council to be referred back to the Chemical Committee to prepare for publication in the Journal.

VETERINARY.—Mr. Raymond Barker reported the recommendation of the Committee that, in consequence of the repeated abuse of the privileges of entry, the disqualification of their pigs, and abusive language towards the officers of the Society, John Dyson, of Adelphi Hotel, Dock Street, Leeds, and James Graham, of 1, Blackburn's

Buildings, York Road, Leeds, be excluded from exhibiting in future at the shows of this Society. The Committee further recommended that the Stock Committee be requested to frame a resolution for the prevention of future erroneous entries.

GENERAL NEWCASTLE.—Colonel Challoner reported that the Committee recommended that the showyard be open on Monday the 18th July, and close on Friday evening the 22nd, and that the trials of implements commence on Wednesday, July 13. Maps and plans of the showyard and trial grounds were laid on the table, and the Council unanimously accorded their thanks to Mr. Torr for the time and care he had bestowed on the selection of the fields. The Committee further recommended that Mr. Jacob Wilson be authorised to make such arrangements as may be necessary to secure green food, hay, and straw for the purposes of the Show. In consequence of the change and extra quantity of land taken for the trials of implements, it was desirable that £150 be paid to the local Committee. This report was adopted.

The Annual Reports of all the standing committees were presented by the respective Chairmen.

The Standing Committees for 1864, viz., Finance Committee, Journal Committee, Chemical Committee, House Committee, Implement Committee, Veterinary Committee, and Stock Prizes Committee, were appointed.

The Council having fixed the General Meeting of the Society for 11 o'clock on Wednesday next, Dec. 9th, adjourned to the first Wednesday in February.

A Special Council was held at the rising of the Monthly Council, for the purpose of receiving the Reports of the Implements and Stock Prizes Committees and of settling the Prize-sheets for the Society's Show at Newcastle-upon-Tyne.

The half-yearly general meeting of this society was held on Wednesday morning, December 9, in Hanover Square, and was very fully attended, under the direction of the new president, Lord FEVERSHAM.

The secretary (Mr. HALL DARE) read the report.

REPORT OF THE COUNCIL,

The Council have to report that since the last General Meeting 317 Members have been elected, while 2 Governors and 33 Members have died, and 22 Members have been removed from the list; so that the Society now consists of

79 Life Governors
87 Annual Governors
1808 Life Members
3952 Annual Members
17 Honorary Members,

making a total of 5,443 at the present time; being an increase of 266 within the year.

The Finances of the Society are in a satisfactory condition, as is shown by the Balance-sheet to the 30th June, which has been already published in the *Journal*; since which time the Finance Committee have reported that all claims against the Society submitted to them up to their last Meeting had been discharged. The funded property invested in the names of the Trustees remains at £16,488 17s. 10d. stock in the New Three per cents.

The collection of the arrears of subscription has been steadily progressing; the amount now due, inclusive of those in arrear for the present year, being £331; and the Council hope that, by an early payment of the subscrip-

tion, the Members will enable them to frame the financial arrangements for the ensuing year.

The period of holding the Half-yearly Audits having been more closely approximated to the termination of the half-years, the Council are thus enabled to inform the Members, in each successive *Journal*, as to the latest state of the Society's accounts.

The Worcester Meeting, notwithstanding the unfavourable weather on some days of the Show, fully satisfied the expectations of the Council. The authorities of the city and the Local Committee contributed greatly to promote the objects of the Society on the occasion, and received at the time the public thanks of the Members at the General Meeting held in the Town Hall.

The Balance-sheet of the Meeting, which is now laid before the Members and will be published in the February *Journal*, shows that the system of distributing the Forage by means of tickets furnished to exhibitors, has proved satisfactory, and has tended to reduce this item of expense in the Live Stock department.

The quadrennial system for the trial of Implements, which commenced at Warwick, has terminated this year at Worcester, and, at the request of the Council, the Implementation Committee have given the subject their careful consideration. The Council have adopted the recommendation of the Committee, that the trials should as formerly be triennial, such special prizes and medals for miscellaneous improvements being also offered each year as the Council may determine. The following is the schedule of arrangement:—

Special Prize for Steam Cultivation.

1864.—I. IMPLEMENTS AND MACHINERY FOR THE DRAINAGE, TILLAGE, AND CULTIVATION OF LAND.—Tilts and brick machines, draining implements, grubbers, ploughs, cultivators, eld crushers, rollers, harrows.

1865.—II. IMPLEMENTS AND MACHINERY FOR THE CULTIVATION AND HARVESTING OF CROPS.—Drills and distributors, horse hoes, mowing machines, reaping machines, haymaking machines, horse rakes, carts and waggon.

1866.—III.—IMPLEMENTS AND MACHINERY FOR THE PREPARATION OF CROPS FOR MARKET AND FOR FEEDING STOCK.—Steam engines, thrashing machines, dressing machines, mills and crushers, chaff cutters, cake breakers, root cutters and pulpers, dairy implements.

In order to consider the most effectual means of obviating the practice of unfairly clipping sheep for exhibition at the Society's Country Meetings, the Council appointed a Committee to take this subject into consideration, and have approved of the following regulations, which they trust will effectually prevent the recurrence of an evil so generally complained of:—

1. That sheep exhibited for any of the prizes must have been *really and fairly shorn bare* after the 1st of April in the year of the exhibition; and that the date of such shearing form part of the certificate of entry.
2. That two inspectors be appointed by the Council, to examine the sheep on their admission to the Show-yard, with instructions to report to the Stewards any cases in which the sheep have not been *really and fairly shorn bare*.

The Country Meeting next year will be held in the week commencing Monday the 18th July, and the authorities at Newcastle-upon-Tyne are making great exertions to place the land for the Show Yard and trial fields in a course of due preparation.

The Council have decided on the Prize Sheet for the Newcastle Meeting. That for Live Stock will amount to £1,200, being an increase over last year of £625; and for Implements the amount will be £500, being an increase over last year of £240, making a total increase of £865.

The above will, in addition to the usual prizes, include classes for Channel Islands, Ayrshire, Scotch Horned, and Polled Cattle, Clydesdale Horses, Cheviots, and Black-faced Mountain Sheep.

By order of the Council,
H. HALL DARR, Secretary.

Mr. WIDICOMBE said he had great pleasure in moving that the report be adopted, adding that, as a member who was connected with Exeter, he trusted that that city would in 1865 give the society a hearty reception.

Mr. DREW, in seconding the motion, observed that the West of England, with which he was connected, was fully alive to the importance of the meeting in 1865, and he hoped that when the meeting had taken place the Council's paper respecting it would be at least as favourable as that with regard to Worcester.

The motion having been adopted, the Secretary read the following balance-sheet:—

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

HALF-YEARLY CASH ACCOUNT, FROM 1ST JANUARY TO 30TH JUNE, 1863.

		Dr.			
		£	s. d.	£	s. d.
To Balance in hand, 1st Jan., 1863:—					
Bankers.....		349	2 8		
Secretary		33	3 9		
				383	6 5
To Income, viz. :—					
Dividends on Stock		226	1 8		
Subscriptions :—		£	s. d.		
Governors' Annual.....		300	0 0		
Members' Life-compositions		450	0 0		
Members' Annual..		2,294	5 9		
				3,270	5 0
Journal :—					
Sales		116	19 8		
Advertisements		23	16 4		
				140	15 10
Veterinary :—					
Sale of Pamphlets		5	1 8		
Sale of Wool		8	3 0		
				4,334	0 8
To London Show				3	6 0
To Worcester Meeting				3,618	0 0
				40,296	15 8
		Cr.			
By Expenditure :—					
Establishment—					
Official Salaries and		£	s. d.	£	s. d.
Wages		397	6 0		
House Expenses,					
Taxes, &c.		257	15 2		
				655	1 2
Journal :—					
Printing		386	1 0		
Stitching		65	0 0		
Delivery, Advertising,					
&c.		109	18 3		
Prize Essays		25	0 0		
Other Contributions..		5	10 0		
Editor's Salary		250	0 2		
				841	9 3
Chemical :—					
Consulting Chemist's					
Salary		150	0 0		
Grant for Investiga-					
tions, 1863		300	0 0		
				250	0 0
Veterinary :—					
Grant to Royal Veterinary College				100	0 0
Stock :—					
Brokerage, &c.				9	13 6
Postage and Carriage ..				45	18 0
Advertisements				15	3 0
Sundries				10	16 10
Subscriptions returned (paid in error)				2	0 0
Wool at International Exhibition ..				9	16 4
				1,066	18 7
By London Show				563	16 1
By Worcester Meeting				1,000	16 4
				1,563	16 4
Total Payments				8,649	8 0
By Deposit with London and Westminster Bank ...				3,000	0 0
By Balance in hand :—					
Bankers		£2,565	1 11		
Secretary		1	8 9		
				2,566	10 8
				40,296	15 8

BALANCE-SHEET, 30TH JUNE, 1863.

		LIABILITIES.			
To Capital:—		£	s. d.	£	s. d.
Surplus, 31st December, 1862		21,557	18 2		
Surplus of Income over Expenditure during the Half year, viz.:					
Income		4,344	6 3		
Expenditure		1,966	13 7		
				2,377	7 8
To London Show:—				23,815	5 10
Difference between Receipts and Expenditure, the latter exceeding the former by				3,584	10 9
				£20,230	15 1
		ASSETS.			
		£	s. d.	£	s. d.
By Cash in hand		2,586	10 8		
By Deposit Account, London and Westminster Bank		2,000	0 0		
By New 3 per Cent. Stock £16,468 17s. 10d. cost		15,891	11 1		
By Books and Furniture, Society's House, Hanover Square		2,000	0 0		
				23,468	1 9
By Account at Credit of Worcester Meeting				2,357	6 8
				£20,230	15 1

(Signed) A. N. HOOD, on behalf of Finance Committee.

Examined, audited, and found correct, this 11th day of August, 1863.

(Signed) WILLIAM COPPELAND ASTBURY, } Auditors on behalf
HENRY CORBET, } of the
WILLIAM COHEN. } Society.

The Secretary also presented the following statement, as proposed by the Finance Committee, of the—

COUNTRY MEETING ACCOUNT, AT WORCESTER, 1863.

RECEIPTS.		£	s. d.
Subscription from Worcester	1800	0 0	
Admissions to show-yard	5485	3 1	
Sale of catalogue	506	10 0	
Implement exhibitors' payment for shedding ..	1035	19 0	
Non-members' fees for entry of implements ..	49	5 0	
Fees for entry of live-stock	408	10 0	
Fees for horse-boxes	318	0 0	
Fees for nurse cows	18	0 0	
Fines for non-exhibition of live stock	25	10 0	
Extra lines in implement catalogue	22	10 0	
Sale of wheat, barley, &c.	149	4 0	
Sale of sundries	14	8 0	
Excess of payments over receipts	279	3 9	
	£10,112	2 10	

EXPENDITURE.

Show and trial yards, horse-boxes, hire of hurdles and turnstiles	3382	11 11
*Repairs to engineering plant, and carriage, &c. ..	86	5 8
Judges: implements, £212; stock, £310	522	0 0
Consulting engineer's assistants	145	10 2
Veterinary-inspectors and assistant	64	16 0
Metropolitan police	136	0 0
Clerks and assistants: secretary, £80; hon. director, £35 11s. 8d.; bankers, £21	116	11 8
Assistant stewards: implements, £31 10s.; stock, £25 4s.; forage, £27 1s.	83	15 0
Foremen of various departments	77	10 0
Yardmen and watchmen, £167 4s; fieldmen, £13 7s. 6d.; forsgemen, £7 4s.; waggons, £23 15s.; grooms, £11 17s. 6d.	40	12 6
Index-clerk and money takers, £71 8s.; door-keepers, money-changer, &c., £28 7s.	99	15 0
Lodgings for stewards, implement judges, veterinary inspectors, engineers, &c.	306	8 0
Refreshments for ditto	112	13 0
Catalogues—implements, £345 10s.; stock, £109 10s.; Awards: implements, £5 17s.; stock, £70 14s.; sellers of, £27 6s.; packing cases, £18 10s.	577	7 0
Printing—Prize-sheets, certificates, admission-		

orders, tickets, railway papers, parchment labels, circulars, programmes, notices, &c. ..	256	17 0
Advertising—Newspapers, £208 17s. 6d.; railways and bill posting, £57 12s. ..	266	9 6
Postage and carriage, £71 11s. 5d.; stationery, £13 5s. 7d.	84	17 0
Wheat and barley, £290; insurance of, 16s. ..	290	16 0
Hay, £135 2s. 6d.; straw, £189 8s. 8d.; vetches, £204 1s. 6d.; oats, £11 5s. 3d.	539	17 11
Bankers—Commission, £15; cab hire, &c., £7 1s. 6d.; base coin, £2 2s. 4d.	24	3 10
Surveying	26	3 6
Hire of fire-engines, £9 9s.; hire of steam-engines, £7; use of driving belt, £1 10s. ..	17	19 0
Coals, £19 1s. 2d.; corn and coal sacks, £26 10s.; bags and twine, £3 16s. 7d.	49	7 9
Badges	11	12 6
Official staff—Board, lodgings, and travelling expenses	25	8 6
Sundry small bills and petty payments	28	16 11
Prizes—implements, £280; stock, £2,195; medals, £77 2s.	2552	2 0
	£10,112	2 10

Dec. 2, 1863.

A. N. HOOD,
Chairman of Finance Committee.

* The sum of £73 for new dynamometer and testing apparatus is not included in this account, but is charged to the general funds of the society.

Mr. RAMSAY moved a vote of thanks to the auditors. After speaking of the arduous nature of their duties, and the efficient manner in which they appeared to be performed, he said he hoped that the meeting at Newcastle in the ensuing year would give them some additional trouble through the accession to the funds of the Society (laughter).

Mr. C. STOKES seconded the motion, which was agreed to. General HOOD, in moving a re-election of the auditors, said, as chairman of the Finance Committee, he could testify that the task of auditing the accounts was performed in a most efficient manner. The auditors did not discharge their duty in a superficial manner, but they thoroughly looked into the accounts, and carefully examined every voucher, and he felt that the Society were much indebted to them for gratuitously rendering such valuable service (cheers).

The motion having been adopted, Mr. H. CORBET said: As senior auditor present, he had to thank the meeting for the vote of thanks just given to the auditors, and the vote of confidence manifested by their resolution. The Finance Committee of that Society was now so thoroughly efficient that the duties of the auditors were not quite so arduous as Mr. Ramsay seemed to imagine. They paid great attention, however, to the accounts. He would only add that it was a great improvement that the last half-year's balance-sheet was now published in the Society's Journal in anticipation of the meeting, so that members were enabled to examine the items before they came there (Hear, hear).

The routine business having been disposed of, The CHAIRMAN inquired whether any one had any question to ask, or any suggestion to make, which might be referred to the Council for their consideration.

Mr. S. SIDNEY said he wished to make a few observations with regard to the present position of the Society. He was sure no zealous member of the Society could help regarding with a feeling of satisfaction the changes which had recently taken place. They saw an additional number of practical members placed on the Council; they saw, also, that the innovation of having the meetings open, and reporters present to give publicity to the discussions, had given additional interest to the proceedings. But he thought they would all agree with him that so great and important a Society as that could not stand still, and that it was advantageous for outsiders like himself occasionally to suggest further improvements. Now he must at the outset altogether disclaim any idea of saying anything personally offensive to any gentleman connected with the department on which he was going to remark; but he believed he was only expressing the feeling of every person who took an interest in the Journal of the Society when he said that the principle on which that Journal was managed was not a principle that was likely to make it successful. They had an editor who was an accom-

plished gentleman, possessed of a knowledge of many languages and sciences; but, speaking as a practical man himself in such a matter, he ventured to say there was not a publication in the kingdom which had been successful where it was made the duty of the editor to contribute a large portion of the matter. The editor's duty was rather that of revising the productions of other persons; and although he was quite ready to give credit to the industry of the Editor of the *Journal*, and his knowledge of languages, yet he must say that as many of his papers were translations of the works of foreigners, and were not practical papers, they were papers that did not give satisfaction. That had been universally said; and it arose from the circumstance that, although the committee of the *Journal* were accomplished gentlemen, they had no practical acquaintance with the system by which great journals had been made successful. If they entertained any doubt upon the point, they had only to refer to their own respectable publisher, Mr. Murray, who would tell them that the *Quarterly Review* had achieved success not by the Editor's getting up articles of his own, but by his revising the articles of others. Another question which he was desirous of submitting to them was, whether, considering the great expense it was necessary to incur in order to bring forward important improvements, such as steam cultivation, the time had not arrived when they might look over their prize-list with a view of seeing whether some matters of course and quite of a common-place character might not be advantageously given up. A third point he would mention was this: he wished to ask gentlemen who had belonged to the Society for many years, or who had only lately joined it, whether it were thought the building in which they were then assembled, and its annexes, were worthy of so great and so influential a corporation? He thought he could give them reasons why a very decided and sweeping improvement should be made. He would not dwell upon the fact which was referred to at the last meeting of the Jonas Webb Testimonial Committee, when, in reply to the suggestion that a portrait of Mr. Webb might be placed in this room, it was objected that there was no space to hang it there; he would merely point out that the Smithfield Club had housed themselves in a pretty good building, and that the Central Farmers' Club were making preparations to house themselves also in respectable quarters. The question, then, was whether, with the large funds at the command of the Royal Agricultural Society, they too might not more advantageously lay out some of their money in improvement of their premises than by investing it in the public funds. But, without dwelling on the importance of having better rooms and offices, there were two other practical matters which were worthy of their attention. One was, that they had not, and there did not exist in this kingdom, what was to be found in great perfection in other countries—that was a good agricultural library of books of reference. True, they had many good books; but no funds were regularly laid out for the formation of a library of reference, consisting of rare, curious, and expensive works. He might be told that few would come to read the books if they had them; and that might be so. Still, if only one or two students did so in the course of a year, in his opinion that would repay the cost. He did not propose that they should open a reading-room supplied with newspapers, where people might go and idle away their time; but he insisted that there ought to be, in connection with the society, a respectable library, containing the agricultural literature of this and other countries (Hear, hear). Again, it had often been suggested, and he ventured to suggest it once more, that the time had arrived when the Society ought to have a museum attached to it. He did not mean a mechanical museum, because he thought that would be a mistake, as things were superseded now-a-days almost as soon as they were brought out. He had been in Edinburgh and had there seen the museum of the Highland Society, comprising a beautiful collection of vegetable productions of the most extensive and interesting character. At the Agricultural College at Cirencester, too, there was a fine laboratory; and seeing that this Society had professors of European celebrity at its service, he thought they would do well to establish not only a library, but also a laboratory and a museum that would be worthy of the status they occupied in the estimation of the public. They had carried their shows to the utmost perfection. They had awakened an interest and taken root in every

county in England. And really a great Royal Society like that ought to have a central point, where they could meet and the world might see what they were doing (Hear, hear). He knew he might be met with the old objection about funds; but there he took exception to the theory which had been laid down by Mr. Fisher Hobbs. That gentleman had been talking to some actuary, who took that excessive view of the importance of his profession which was usually taken by lawyers respecting theirs, and he said that the right thing for the Council to do for the protection of those who had paid life subscriptions was to invest the money derived from that source, as if they owed the life-members an annuity. Now all the Society undertook to do for a life-member was to supply him with a copy of the *Journal*, which they did at an expense of about 6s. a-year. They also bound themselves to admit the life-members to the meetings. This being so, he thought they might sink these funds in any manner that might be most advantageous to the Society. Looking at the state of the balance-sheet and the condition of their funds, and taking into account the increased income that would be sure to accrue from their undertaking a work of a popular character, he considered they would have no difficulty in raising the money that might be required for the improvement of the Society's house and the establishment of a good library and museum (Hear, hear).

Sir J. H. MAXWELL differed from the opinion expressed by Mr. Sidney, that the *Journal* of the Society was not properly conducted. So far from that, he had always regarded it as an admirably-managed publication (Hear, hear). Its great merit appeared to him to be the plain sensible manner in which its articles on all useful and practical subjects were written, and which was suited to the capacity of every man, whether he belonged to the highest of the educated classes or to the lowest class of farmers. Contrasting the Society's *Journal* with that of the Highland Society, he himself had had occasion, when in Edinburgh, to tell the latter that they would do well to take a lesson and pattern from the manner in which the *Journal* of the Royal Society of England was conducted (Hear, hear).

Mr. J. C. MORTON wished to call attention to the fact that among the ten objects for which the Society was incorporated, one was to take measures for the education of those who depended on the cultivation of the soil for their support. He had been a member of the Society from the time of its formation, but he was not aware that anything whatever had yet been done by the Society in discharge of its duty in reference to that particular point.

The CHAIRMAN said: the cause of education had been taken up by the country in every part since that object was agreed to, and he hoped it would continue to spread. He could only say that in his own neighbourhood education had made considerable advances among the agricultural population, though no doubt there was still room for further and more rapid progress in that direction.

Mr. MORTON was afraid the point was not clearly understood. He had no doubt that the Society had indirectly promoted the education of the agricultural community; it did so alike by its shows, its discussions, and its *Journal*; but with regard to the object referred to (No. 7), the Society had taken no direct steps for the education of the profession.

Mr. SIDNEY was desirous of doing the fullest justice to the great ability displayed in the articles which were published in the *Journal*; but he thought that that publication might be improved by not requiring the Editor to contribute two or three articles himself, but rather confining him to the revision of articles furnished by practical men.

On the motion of Mr. MOORE STEVENS, seconded by Sir J. H. MAXWELL, and put to the meeting by Lord BERNERS, a vote of thanks was passed to Lord Feversham, for his able conduct in the chair.

Mr. DUCKHAM asked the indulgence of the meeting while he interposed to draw the attention of the Council to the increased difficulty experienced by the exhibitors in getting away from the Society's shows. Unless some steps were taken to obviate that difficulty, he feared their show-yards would very materially suffer in their character. The show at Worcester this year closed on the Friday. At six o'clock on the Saturday evening the Hereford stock was ordered to be untied and taken to the railway siding. There a large portion of that stock was kept throughout the night by the side of the train; and it was not until eight o'clock on Sunday morn-

ing that they could be removed (Hear, hear). Thus they were fourteen hours out of the sheds, exposed all the time to severe weather. The whole of Sunday was spent on the road; and it was three o'clock on Monday afternoon when his cattle reached his place, although it was distant only forty miles from the Show (Hear, hear). A great many exhibitors felt, and he himself was of opinion, that it was quite possible for the Council to make better arrangements with the railway authorities; for people could not afford to have valuable animals exposed in that manner (Hear, hear). In conclusion, Mr. Duckham urged on the Council the propriety of consulting the Bath and West of England, the Birmingham and Midland Counties Society, and the Smithfield Club, with a view of endeavouring to agree upon a uniform date for the commencement of the breeding year.

The CHAIRMAN: My lords and gentlemen, for the honour you have conferred upon me in passing the vote of thanks, I beg leave to return my most sincere and grateful acknowledgments. To the gentlemen who have proposed and seconded the resolution, and to you who have received it so kindly and cordially, my best thanks are equally due. I can assure you I should have felt considerable diffidence in undertaking the important duties of the presidency were I not well aware that the success and prosperity of our Society does not depend upon the efforts or energies of any single individual; for the Society is now supported by most of the eminent agriculturists of this country, and it has also, I believe, taken firm hold on a large portion of the working classes, as evidenced by the numbers who visit the Show-yard, in whatever part of the country our exhibitions are held, and who seem anxious to observe the progress that is made and the improvements that are effected through the operation and instrumentality of this institution. It will be remembered probably by some gentlemen present that at the time of the foundation of the Society it was remarked by Lord Spencer, that agriculture was then in its infancy. This appeared perhaps to some who had not duly considered the matter a somewhat exaggerated view of the case. But the lapse of time and the results of experience have fully confirmed and established the opinion and authority of that noble lord. We have since seen agriculture advancing with wonderfully rapid strides in every department—in the breeding and rearing of live stock, in the manufacture of implements, and in the extension of machinery, and in everything that affects the cultivation of the soil. We have now arrived at an important era in the agricultural history of the country in having witnessed the introduction of the steam-plough. That great and stupendous agent—steam—has not only brought distant lands into closer proximity, it has not only greatly augmented the amount of the staple manufactures of the country, and the commerce of the nation, but it is now applied also to the cultivation of the soil. Those who have adopted the new system

have reported most favourably upon it; they anticipate that at no distant period steam culture will spread far and wide through the length and breadth of the land, its chief effects being to diminish the cost of production, to augment the produce of the soil, and to render the soil permanently more fertile. These, you will agree with me, are most important considerations; and it is, I think, advisable that all who are engaged in agricultural pursuits, and especially young farmers about to enter their profession and for the first time to launch, so to speak, their boat upon the waters, should devote a portion of their time to the study of the subject of steam tillage, in order that they may watch the progress made and the improvements effected, until steam culture shall have arrived at a greater degree of advancement, and a more complete facility of adaptation than it has hitherto attained. I will not detain you by entering any further into this important question. Some valuable suggestions have just been made by different gentlemen, and I have no doubt the Council of the Society will take them into consideration. Mr. Sidney has favoured us with some remarks, as he has done on previous occasions, having for their object the improvement of the institution in various particulars; and I have no doubt they will receive from the Council due attention. Mr. Morton has called attention to the subject of the scientific education—I suppose that is what he meant—of all who are engaged in agricultural operations; and that matter will also doubtless receive proper consideration. A gentleman who has just sat down has spoken of the great difficulties which he has experienced in transporting his stock from the shows in the country. Reading, as I do, in a distant part of the country, I know that great delay frequently arises before the stock which has been exhibited can be got home again; and if any improvement can be made in that respect, I am sure I shall be far from regretting that our attention has been called to the subject. I feel unwilling to trespass any further upon your attention. I will therefore conclude by congratulating you on the present satisfactory position of the Society, and by expressing my earnest hope and confident expectation that this great national institution may long continue to flourish; dispensing, as heretofore, much valuable information and useful knowledge throughout the country; conferring important and essential benefits on agriculturists, promoting the welfare and furthering the interests of every class of the community, and at the same time contributing to uphold the stability and maintain the pre-eminence of the British Empire (cheers).

Before the meeting separated, Mr. Stearn, of Wickham Market, complained of the conditions under which the breeding sow class is at present exhibited; remarking that alterations had been made, partly in response to his own suggestions, but that the matter had become worse and worse every year.

The proceedings then terminated.

OUR GRASS LANDS.

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

Within the last few years considerable advances have been made in grass-land cultivation; and those improvements have not been confined to the removal of stagnant waters and injurious timber-plantations: very valuable experiments have been instituted upon the effects of certain fertilizers upon the natural grasses of our pastures. The composition of these plants has been chemically ascertained. These analyses, too, have not been limited to the mineral portion of each grass, but their widely-differing organic or nutritious qualities have been demonstrated. Then, again, the best proportions of seed to employ, and the most profitable artificial dressings to bestow upon each grass, has been shown. It is always interesting to notice the accounts which have escaped to us of the English farming of the olden time. Tusser, who was almost the first English agricultural writer, gives us sundry poetical

notices of most of the practices of the farmers of the reign of Henry VIII. Pastures intended for hay are alluded to in his directions for the husbandry of February. After advising the farmer to fence it, and spare it, and dung it, employ the mole-catcher, and spread the mole-hills, he ends with the curious proviso—

"If pasture by nature is given to wet,
Then bear with the mole-hill, though thick it be set,
That lamb may sit on it, and so to sit dry,
Or else to lie by it, the warmer to lie."

Such was the grasier's comic reasoning of more than three centuries since; and it is not a little remarkable how very tardily the general attention of the agriculturist has been directed to the value and improvement of our grass lands. To this neglect many causes have perhaps contributed: the high price of corn dur-

ing the wars of the French Revolution; the difficulty of procuring artificial dressings, rendering the farmer generally unwilling to do more than leave the improvement of his pastures to the stock with which he grazed them, or the flood waters which rested upon them. It was only during the last years of the eighteenth century that crushed bones began to be employed on grass lands in some of our northern counties; it is only in our own time that these have been dissolved in sulphuric acid. Guano was not even imported into England until 1840; several years then elapsed before cubic petre became available; it was still more recently that the sulphate of ammonia, made from the refuse liquor of our gas works, and other sources, was brought into the market. So that it has been, in fact, during a very recent period that a sufficiently copious supply of artificial dressings for our grass lands has been procurable. This being near the season when these fertilizers are best applied to pastures, we may profitably bestow a few minutes in refreshing our memories, by referring to the result of some of the recent reports on this very important inquiry.

I need hardly refer to the fact that it is only in the absence of a sufficient supply of good farm-yard manure that other artificial dressings must be had recourse to. The authors of the elaborate and valuable experiments, so long continued at Rothamsted, readily admit the truth of this conclusion. It is at nearly the end of

the last report of their experiments that Mr. Lawes and Dr. Gilbert remark (*Jour. Roy. Ag. Soc.*, vol. xxiv., p. 528): "Upon the whole, the evidence goes to show that stable or farm-yard manure is a much more perfect restorer of the constituents removed in the hay crop than those purchased or so-called artificial manures which, in a practical or economical point of view, can be advantageously employed. Farm-yard dung is, however, comparatively slow in its action. These characters point to the peculiar fitness of such manure for meadow land mown for hay; and as it was shown in our last Report, the description of herbage developed by it was much more complex, and upon the whole superior in quality, to that developed by the more active artificial manures. On the other hand, provided the restoration of the potash and silica of the hay crop be duly accomplished by means of farm-yard manure occasionally applied, its slowness of action may be advantageously compensated by a judicious use of some of the more active artificial or purchased manures."

In the following table will be found the result of the application at Rothamsted Park, of the same manure to the same grass for a series of years—what is in the report called "mixed mineral manure," being composed of a mixture of

800 lbs. sulphate of potass
200 lbs. " soda
100 lbs. " magnesia.

PRODUCE OF HAY PER ACRE.

|| MANURES PER ACRE, PER ANNUM.	Annual Average Produce—							
	of four years (1859-62).		of seven years (1856-62).					
	T. cwt.	qr.	lb.	T. cwt.	qr.	lb.		
SERIES 1.—Without Direct Mineral Manure.								
Unmanured	1	4	3	27	1	4	1	4
Unmanured (duplicate plot)	1	7	0	23	1	6	0	15
Mean, or standard unmanured	1	6	0	11	1	5	0	24
200 lbs. each, sulphate and muriate ammonia	1	11	3	6	1	13	0	23
200 lbs. each, sulphate and muriate ammonia, and 2,000 lb. sawdust	1	13	2	10	1	14	1	3
275 lbs. nitrate of soda	1	15	3	15	1	13	3	25†
550 lbs. nitrate of soda	1	18	0	10	1	16	3	10‡
SERIES 2.—With Direct Mineral Manure.								
Superphosphate of lime	1	8	1	0	—	—	—	—
Superphosphate of lime, and 200 lbs. each, sulphate and muriate ammonia	2	3	2	5	—	—	—	—
"Mixed mineral manure"	1	16	1	4	1	14	3	27
"Mixed mineral manure,"* and 2,000 lbs. sawdust	1	17	0	6	1	16	2	9
"Mixed mineral manure," and 200 lbs. each, sulphate and muriate ammonia	2	14	3	3	2	16	3	1
"Mixed mineral manure,"* 200 lbs. each, sulph. and mur. ammonia, and 2,000 lbs. sawdust	2	13	0	21	2	15	2	0
"Mixed mineral manure," 200 lbs. each, sulphate and muriate ammonia, and 2,000 lbs. cut wheat-straw	2	16	2	17	2	14	3	27
"Mixed mineral manure," and 400 lbs. each,† sulphate and muriate ammonia	2	19	2	14	3	1	1	16
"Mixed mineral manure" (including 200 lbs. each silicates, soda, and lime), and 400 lbs. each sulphate and muriate ammonia	—	—	—	—	—	—	—	—
"Mixed mineral manure," and 275 lbs. nitrate of soda	2	5	2	19	2	4	0	12‡
"Mixed mineral manure," and 550 lbs. nitrate of soda	2	11	3	21	2	11	2	15‡
SERIES 3.—With Farm-yard Manure.								
14 tons farm-yard manure	2	4	1	20	2	2	2	15
14 tons farm-yard manure, and 100 lbs. each, sulphate and muriate ammonia	2	8	3	24	2	8	3	8

* With sulphate of potass excluded, and the amount of sulphate of soda increased, in 1862.

† Only 200 lbs. each in 1859, 1860, and 1861.

It was after having visited the park in which these experiments have now during several years been conducted, that Professor Voelcker recently addressed the Council of the Royal Agricultural Society; and I deem no apology necessary for the insertion in this paper of a considerable portion of his valuable observations, and let the reader mark, that in our efforts to improve the herbage of our grass lands, we must ever remember that it is not only the amount, but the quality of the grasses that we are endeavouring to improve. Upon the whole

retrospect, the Professor (*ibid.*, p. 640) arrived at these conclusions, viz., that "The most valuable manuring substances for grass land are the following: First, nitrogen, either in the shape of ammoniacal salts, or in that of nitrates, and organic matters capable of producing on decomposition either nitrates or ammonia; secondly, the phosphates; and, thirdly, the alkalies. These are the most important; but we have also to consider the effects of lime and silica. What, then, are the effects of ammonia upon grass land? These, in the first place,

vary according to the presence or absence of available minerals—that is to say, with the quality of the soil. If there is an abundance of valuable mineral matter, and if this be present in an available condition—that is to say, in such a state of combination that it can be taken up by the roots of the plants—then ammoniacal manures are very valuable indeed, for they promote a very luxuriant development of the herbage. But if the mineral constituents—the phosphates, the salts of lime, the alkalies, and the soluble silica—are deficient, by the application of ammoniacal manures alone, we should deteriorate the quality of the herbage, and within a very few seasons there would be no very large impression visible in its quantity. The produce of the unmanured portion of the land at Rothamsted has amounted to about 1 ton 6 cwt. The ammoniacal salts alone have not increased the produce nearly so much as when given in conjunction with minerals. The produce in the latter case is nearly treble that in the former. The addition of ammonia even to farm-yard manure produces a striking effect. The latter contains but little ammonia in comparison with the amount of mineral matter and carbonaceous matter there present. To dispose at once of the carbonaceous substances—organic matters free from nitrogen, and containing chiefly carbon and hydrogen with some oxygen—I would say that in Mr. Lawes's experiments I have found scarcely any effect from them either in the quality or the quantity of the produce. In farm-yard manure it is not so much the carbonaceous element which tends to increase produce, as the nitrogenous and mineral portion."

The Professor was strongly impressed with the different appearance of the grasses, at Rothamsted, to which farm manure and ammoniacal salts had been long applied. You will notice he remarked, "In the latter a difference in the colour: the grass is a deeper green; it is also somewhat higher, and there is more of it. There is also this remarkable difference, that whereas in the unmanured portion we have great variety, a large mixture of plants, through the application of ammoniacal salts the herbage becomes more simple. When ammoniacal salts have been applied in conjunction with mixed minerals, the effect is very striking; indeed the quantity of produce is double that derived from ammonia alone. An extra quantity of ammonia increases the produce to a very remarkable extent, and it further reduces the number of species of plants, pushing forward certain grasses, to the exclusion of almost every other. Among the first to disappear are the leguminous plants, especially if large quantities of ammonia are applied, even though a supply of mineral matter may be present, and these are among the more nutritive of our herbs. On the whole acre plot thus treated, it would, I think, be difficult to find any clover; and moreover, it is almost amusing to observe how certain grasses take the place of others. Thus, when a large dose of ammoniacal matter is used in conjunction with minerals, cocksfoot especially and tufted hair-grass supersede many other grasses.

"The effects produced by nitrates seem in some degree to differ from those of ammonia. Nitrate of soda does not so materially affect the leguminous tribe of plants as do ammoniacal salts. As to mineral matters, phosphate and alkaline substances may be fairly taken together; for those plants which are stimulated by phosphates are also benefited by alkaline manures, and more especially salts of potash. The action of mixed mineral manures, composed of phosphate of lime in a soluble condition and salts of potash, on the whole clover tribe of plants is very remarkable. Under its influence you can see clover not merely here and there, but all over the plot; while the rougher grasses are less luxuriant. The cocksfoot appears to be almost a

different plant from that which received an excess of ammonia; it is much lower, and not so luxuriant; while the red and white clover and the wild vetch are seen all over the field. In other words, alkalines and phosphates promote a good quality of herbage; but they have not so great an effect upon the amount of produce.

"Returning now to the subject of the improvement of pastures, let us suppose that the land has been well drained, that it is moderately porous, and that there is a fair depth of soil; but that the produce is scanty, and the herbage not very good. How are these defects to be remedied? can both be dealt with at once? In most cases we ought, I think, to endeavour to improve to some extent at least the quality of our herbage, and at the same time try to get not an excessive but a remunerative amount of produce. If we look too much to quality, perhaps the means of effecting improvement may be considered by practical men too expensive; on the other hand, if we look entirely to quantity, the quality of the herbage may be much deteriorated: and the result will be remunerative only to the men who sell hay in the neighbourhood of large towns, but not to the consuming tenant or to the landlord.

"But, first of all, we ought to ascertain whether a pasture requires liming or not. As this is frequently the case, and as lime or marl is a cheap manure, before we go to any great expense we ought to settle this point. Lime, which has done marvels on some description of grass land, on others has produced little or no effect. The geological formation of the rocks of a district is not always a good guide in deciding the question whether land requires liming or not. I have met with many cases in which lime has done an immense amount of good, although the land was situate on the oolite formation, abounding in limestone rock. In such regions fields are often to be found in permanent pasture composed of clays of transportation, which have not arisen from the rocks on which they are placed. Such soils, though deposited on limestone rocks, may have been formed from other rocks deficient in lime. Such may be the case even though the limestone may crop out upon the surface; and anyone who was not acquainted with the special character of the land might say that no limo could be wanted, seeing that it came up to the surface; yet the actual soil may, notwithstanding these appearances, be very materially benefited by liming.

"Fortunately, this is a question which may be readily settled. Let a little of the soil be put in a small cup or saucer, and be mixed with spirits of salt (muriatic acid). If it effervesce strongly, an abundance of lime is present; and in that case the land requires no liming. The absence of effervescence, however, is not always an indication that the land is deficient in lime. Soil may be in a condition in which it is not easily attacked by common spirits of salt. In that case no effervescence would take place, and yet sufficient lime may be present; but simple analysis will then very readily clear up the doubt. If land be of a light description, clay marl may be the best dressing; for then we not only apply lime, but we also add to the land a material which generally is rich in potash and soda. Marl, moreover, is valuable as an absorber of fertilizers, whether derived from the atmosphere or from the manure applied to the land. To encourage the growth of good herbage, as well as increase the quantity of the produce, a liberal manuring should be given. Land which is so porous that an excess of water will not remain on it in wet seasons for any great length of time, and which in dry weather can by capillary attraction bring up moisture from below, pays exceedingly well for a judicious outlay on manure. Indeed, all grass land should receive an occasional application of farm-yard manure; for this

alone can supply alkalis, more especially potash, in an economical manner. If we look at the composition of the ashes of our grasses and our hay, taking the mixed grasses and leguminous plants together, we shall find that those ashes abound in potash. If we constantly mow down our grasses, we thereby remove a very large proportion of the alkalis, and the result is that the herbage becomes poor, and the produce decreases.

"But, in addition to farm-yard manure, there are other fertilizers which may be used with very great effect. Guano, judiciously used—that is to say, used on land like many of the clay soils, which constitute, perhaps, most of our pasture soils—produces a very excellent effect upon the produce. Better, perhaps, than guano alone, or bones alone, is a mixture of the two. Indeed, I should like for an average description of land the following mixture: partially-dissolved bones, or bone-dust, dissolved with a sufficient quantity of sulphuric acid to render a portion of the phosphates soluble. We obtain partially-dissolved bones by applying to bone-dust one-third of its weight of sulphuric acid; 4 cwts. of partially-dissolved bones, 2 cwts. of Peruvian guano, and 1 cwt. of salt, perhaps, will produce a manure for pasture which, whilst it will materially increase the produce, will not to any great extent deteriorate the quality of the grass, as might be the case if we used guano alone in the rate of 4 cwts. per acre. This mixture contains the chief mineral constituents required by our grasses and leguminous crops, and adds a fair amount of ammoniacal matter to give us a good yield. The addition of salt is of use, particularly on light land, by keeping it in a moist condition.

"The effects produced by the application of bone-dust to pastures are very variable. On the porous land of Cheshire, and similar soils on the red sandstone formation, the result is very striking. Not only do bones there bring out white and red clover, but promote an abundance of the growth of succulent grasses. The clover itself becomes very luxuriant, and thus helps to increase the produce. On land which is wet and cold, and rests on a poor undrained subsoil, bones often produce no effect. A great many pastures in the West of England, in Somerset, and Devon, a considerable portion of the grass land in Gloucestershire, and, I may add, some of the heavy land which I have seen in Shropshire, cannot be improved by bones. Before, therefore, much money is spent on bone manure, I would recommend that a trial should be made on a small scale."

When thus improving his pastures with artificial dressings, the farmer will not in all cases deem it wise to depend upon Nature's bounty for the production (spontaneous as it were) of the better-class grasses; he

will be adding the seeds of the more valuable kinds. Fortunately for the great farmers of our day, there are now first-class seedsmen, who have skillfully cultivated the best grasses for their use. The path on which the Gibbises first led the way has been followed by other great houses, such as the Suttons of Reading, and the Lawsons of Edinburgh. A mixture of grass seeds, which one of these honourable firms recommend for a good medium soil, as being of excellent properties, and from coming to maturity at different seasons of the year, producing a permanent and ever-green sward, are—

<i>Alopecurus pratensis</i>	1 lb.
<i>Anthoxanthum odoratum</i>	0½
<i>Cynosurus cristatus</i>	1
<i>Dactylis glomerata</i>	2
<i>Festuca duriuscula</i>	4
" <i>pratensis</i>	4
" <i>ovina</i>	2
" <i>rubra</i>	2
" <i>tenuifolia</i>	2
" <i>lohiacea</i>	2
<i>Lolium perenne sempervirens</i>	6
" <i>tenuis</i>	1
<i>Phleum pratense</i>	2
<i>Poa pratense</i>	1
" <i>trivialis</i>	1
" <i>memoralis</i>	1
<i>Medicago lupulina</i>	1
<i>Trifolium repens</i> (white clover)	4
" <i>perenne</i>	4
" <i>pratense perenne</i>	1
" <i>hybridum</i> (Alsike)	2

Facts like these are of a class which will well repay the careful study of the young agriculturist. He will remember, too, that those pastures which in primitive times almost exclusively supplied mankind with animal food, and which in after-days gave place to the growth of corn, are now again becoming as grass lands the most valuable portion of the farm. It is to these which we must hereafter look to support a live stock now steadily increasing in value. It is true that we are not likely to imitate the farmers of the days of the Tudors, when farms were chiefly located in low-lying districts, where the grasses were chiefly produced on diluvial soils, and manured by the sediment from flood-water; but we must rather more and more endeavour to improve the pastures where Nature has been the least bountiful. It is here that the skill of the agriculturist is most needed, and where he will almost ever be found equal to the position in which he is placed. It is indeed an old remark, that in those districts where Nature is most bountiful man performs the least, and that the best farming is commonly to be found where the soils and climate are not of the most favourable character.

THE PRIZE SYSTEM, AS PUT AT THE SOCIETY OF ARTS.

On the Wednesday in the Smithfield Show week a paper was read at the Society of Arts by Mr. J. C. Morton, on AGRICULTURAL PROGRESS: ITS HELPS AND HINDRANCES. We consider that we are paying this able address no ill compliment when we say that, as might have been expected, it was somewhat general in its tone, as befitted the sphere in which it was delivered. Still, the whole essay was very pertinent and suggestive, while it was followed with marked attention by a number of agriculturists present. The discussion, however, over the many merits of such an opening threatened to be swamped in the outset. Scarcely had Mr. Morton resumed his seat amidst such well-deserved applause, than a gentleman,

utterly unknown to the majority of the country-folk present, rose to exhort the farmers on the law of settlement, and the disadvantages of a labourer living away from his work; expounding these well-worn truisms with the self-sufficiency of a man who had hit on a new idea, and persevering until he was fairly coughed down and shuffled off his legs into silence. But, alas! it was only to make way for another of these "permanent fixtures," who of course differed with his learned friend, and the debate over the lecture looked very like going off in another battledoor-and-shuttlecock match amongst the savans at the green table. But, fortunately, Mr. Morton had taken, as the

strongest point in his speech, a question that some of his hearers could not sit quietly under. In fact, like many of the gentlemen who volunteer to talk agriculture at the Society of Arts, Mr. Morton made a fierce onslaught against the implement prize system of the Royal Agricultural Society. To state that we had heard many of the arguments here brought to bear, on many previous occasions in the same congenial atmosphere, can be no slight to Mr. Morton's energetic use of these weapons, while we shall certainly not deny him any further advantage to be obtained from their employment. He says then, by way of illustration: "As regards many machines whose work cannot be expressed or represented by numbers—the plough for example—the prizeman wins, the rest are nowhere. There never probably was a more marked example of this than at the Warwick Show, where a new man appeared as ploughwright, and took many of the principal prizes. His plough, a good and well-made tool, as all of Messrs. Hornsby's manufacture are, pressed the furrow slice tighter home, and left a higher crest than the others. Its work gratified the eye—the judges pronounced it best—and their decision was an altogether excessive advantage given to the firm. No doubt a tightly-laid furrow-slice is, for some purposes, advantageous; but all the tendency of late has been to regard tillage as a smashing up; and where the land tilled lies on a drained subsoil, the rougher the surface is the better for its future tilth. But it is an illustration of the excessive character of the prize system that, whereas the decision at Warwick placed Messrs. Hornsby on a pedestal, while Messrs. Howard and Ransome, and others, were, so far as the Society was concerned, in the case of that particular competition, nowhere, I do not suppose there are ten practical tillage farmers who will say that it matters one penny per acre per annum whether Hornsby's, or Howard's, or Ransomes' plough is adopted as the implement of the farm." For the sake of the argument, let us assume that the equality is as Mr. Morton puts it, and that Hornsby, Howard, and Ransome are in no way superior the one to the other. But what then? Does Mr. Morton remember that previous to the establishment of the Royal Prize System the Ransomes had it nearly all their own way with their ploughs, until the Society fostered and developed the many improvements of their rivals? Who since have won so many premiums for ploughs as the Howards? or, does Mr. Morton think that the Hornsby would have "gone on refining" without the influence of the prize system to incite and reward their experiments? Mr. Morton proceeds to declare, backing his opinion by a few isolated cases, that the prize system has now no influence on sales; but we should prefer to meet him on the general question. Let him ask any of the exhibitors at the Bath and West of England meetings, which he quotes so approvingly, whether "the trade" has ever been so good since the prizes have been abolished at those Shows? Mr. R. C. Ransome, who supported Mr. Morton's views, declared in the course of the evening that "he was quite sure it was not the temptation of prizes that stimulated manufacturers to bring forward improved machinery." But how comes it, then, that Mr. Ransome's own Firm has ceased to exhibit in the West of England since the prizes for implements have been abandoned? Mr. Morton maintains "there need be no fear that the shows would dwindle, though prizes were abandoned." On the contrary, we believe that the interest of such occasions would probably die out with the lack of such a stimulus, while it might possibly be to the passing interest of certain established firms that these meetings should decay. Of course, one great consequence of the prize system should be more opposition; for, as it has made many a man, it may make many a one yet. If one large House declines entering in the West since the premiums have

been withheld, it is only fair to assume that this Firm would do the same when the Royal Society is reduced to the like insipid level. Another argument, as advanced by Mr. Morton, would really seem to be leading to this: "There is one further consideration affecting the implement trade generally, to be urged against it. It adds considerably to the cost of agricultural machines. One firm says it has spent £30,000 during the Society's meetings up till now, in preparing and exhibiting for prizes. Another estimates its expenditure at £20,000; a third says the disorganization of the work, the spoiling of the best men, and the actual expenditure are together past estimate. Who has paid these large sums? Not these firms, but their customers. The cost of a machine is made up of the material it is made of, the labour spent on it, and a whole class of items which come under the general designation of waste charges. These waste charges amount to no less than 30 per cent. of the selling price, and the expenditure at the Agricultural Society's shows is a principal one of them." The simple meaning of all this is, that the more an implement is advertised the more it must cost the purchaser; whereas, we had fondly imagined it was something of a commercial principle, that the more goods a man sold the cheaper he could sell them; and we are quite ready to admit there is no finer advertisement than winning a prize. As to the expense of going about the country, we take it this would be very much the same, whether there be premiums or not, the more especially if Mr. Morton's views were adopted as to Trials and Reports. There is no doubt, however, that the most direct way to curtail these terrible expenses would be to do away with the prizes, and then with the shows, and suffer those who have reached to the top of the tree to rest in peace and quietness where they are.

"Let him take castles who has ne'er a groat."

Such arguments as these were, of course, easily answered. Colonel Challoner had but to cite "the first meeting of the Royal Agricultural Society, at Oxford, where the number of implements exhibited was considerably under 150, and all of the coarsest description of manufacture. He asked what had brought the implements of England to the perfection in which they were at the present time? He submitted it was owing to the system of prizes adopted by the Royal Agricultural Society. He had been brought to this conclusion from his observations as a member of the Implement Committee of that Society. Let them compare the position of implement-makers now and twenty years ago. The progress had been enormous; and he thought that, without the prize system, the manufacturers would not have been guided to the production of the class of implements really required. There were well-known names who had made a high reputation everywhere, and it would perhaps be very agreeable for those gentlemen to rest upon their laurels, with the knowledge that everybody would buy their implements; but what was to become of the humble implement-maker—the man of small means? He had no chance of competing against those great men, except by the help of the prize system. It was the great object of the Royal Agricultural Society to bring forward rising talent." This is but the enunciation of a great truth, founded on the clearest experience; so true and so clear, that one almost tires of being continually compelled to give it in answer. Then, Mr. Robert Smith, in allusion to the Bath and West of England Society and the prize system, spoke with the experience of a West of England man, when he said "he knew the history of that matter, and he believed it had been occasioned by undue dictation on the part of some members of that Society, to whom the Council gave way, and the consequence was that the prizes were discontinued; but he added that a lurking fondness

for the system was manifested by exhibitors of implements at the shows, for they displayed in a corner of their stalls the medals that had been awarded to them." To be sure they do; and but once only let the total abolition of prizes be carried, and we shall have these medals and prize cards flourish in our faces more than ever—by those who have had the chance of winning them in days gone-by. But far away the strongest supporter of Mr. Morton's theory was Mr. John Fowler, who designated the prize system, in so many words, as "A GREAT LIE," and gave his own case to prove it: "He stood in the position of a very successful exhibitor of agricultural implements, so far as prizes were concerned, and had never failed in obtaining the prize he competed for; at the same time, he

thoroughly endorsed every word that Mr. Morton had said with regard to the prize system. He had many times been placed in an unduly prominent position by a prize—a position he had no right to at the time; and if the prize system were continued, it might be he should be placed in a position he had no right to, the other way." So far as we can interpret Mr. Fowler, he intends to say that he has "many times" received prizes he was not fairly entitled to, and it must not be for us to contradict him. We have certainly heard of a prize implement turning out next to useless in the hands of a customer, as of its being eventually returned for some such reason. But we should not ground a rule on any one curious case of this kind, though quite willing to allow that Mr. Fowler's "many times" sounds awkwardly enough.

NORTHERN COUNTIES FAT STOCK SHOW.

The 11th annual exhibition of the Northern Counties Fat Stock and Poultry Society, whose meetings are held at Darlington—the capital of the original Teeswater breed of cattle—took place last month. Hitherto, the erection in which accommodation has been provided for the comfortable housing of the prime specimens of stock brought together by this society has been of a temporary description; but the present year commences a new era, a good covered market having been built at the expense of the town, and in which a permanent residence for the society has been secured at a slight annual outlay.

As proving the unexampled prosperity which has attended the efforts of the committee of management, and the high position which the society has attained, it needs only to be mentioned that 1853 was the year in which the society was founded, when the entries comprised 44 head of cattle, 21 pens of sheep, 12 of pigs, and 144 cages of poultry; total, 221. Whereas this year there were no less than 989 separate and distinct entries, including 70 head of cattle, 39 pens of sheep, 23 of pigs, 28 samples of grain and roots, 8 of hams and bacon, 5 of butter, 1 stand of implements, and 815 cages of poultry—or close upon 1,000. However sanguine may have been the founders of the society, we warrant their highest anticipations are much more than realized. Certainly this year the number of cattle is less by a dozen than last year; but then there were several beasts shown which ought never to have been let out of the farmsteads, where, during the past twelve months, they had professedly been fed, and rather derogated than otherwise the deservedly high position that Darlington has continued to hold as the metropolis of one of the finest districts in the kingdom for the rearing of cattle ever since the time when the Collings made their successful *début* as truly scientific adepts in the matter of judicious or ingenious crossing. It is admitted, by all who had the pleasure of witnessing the present collection, that it very far surpassed last year's in quality—that, in fact, the 70 were worth considerably more money than the 82; and we fully endorse, so far as our observation permitted us to judge, the sentiment thus so generally uttered. In every other department there was a decided increase of entries, and likewise a decided improvement in quality—in no department more so than in that of sheep, which up to the present year has been rather the source of disappointment than gratification. But, happily, the present success makes amends for all previous drawbacks or discomfitures. This, unquestionably, was owing to a very carefully-revised and more liberal schedule of prizes; for the valuable prizes offered have had the effect of

attracting many fresh faces, amongst which none afforded to the Society's friends more real gratification than that of Lord Wenlock, whose eminence in sheep-rearing has long been immovably established. To the same cause is traceable the very large increase in the number of entries of poultry. And here it will not be out of place to notice that the Society appears to enjoy very healthy patronage—the substantial support of many of the district nobility and gentry, who are jealous of the fair fame which Darlington has attained as an agricultural emporium for the North of England. No less than a dozen or so silver cups have been added to the money-prizes this year, the donors being Mr. Slap, Mr. Waterhouse, Mr. Jos. Pease, Mr. J. W. Pease, Mr. Ed. Pease, Mr. Jas. Thompson, Mr. Ed. Backhouse, Mr. H. K. Spark, Mr. R. Thompson, Mr. Jno. Harris, Mr. A. Pease, and others.

To Darlington was specially reserved a cross-bred ox, which would have done infinite credit to any other show, and not improbably would have caused to tremble on their hoofs the proud winners of the trophies held out in the South. Mr. Stewart, of Aberdeen, the very enterprising Scotchman, who has distinguished himself not the less at Smithfield than at Darlington, successively year after year for the past few years, had succeeded in twice attaining the principal place of honour here, by having been declared by the judges to have brought, from the granite hills of his native county, animals surpassing anything in the show; and he had only to gain that place once more, to entitle him to the gold challenge vase, worth 100 guineas. He has at least achieved that at which he aspired, and every person who had the pleasure of handling the splendid animal with which he won the much-coveted prize, admits the justice of his claim and of the judges' award. It was a really noble beast, measuring nine inches more in girth than even one belonging to Mr. J. W. Pease, with which the latter intended to discomfit the "canny" man. It was calculated to weigh 90 stones more than any other beast in the show. The flesh on its ribs was as flexible as India-rubber, your hand dipping down to the palm as you sought to understand how it was possible to bring an animal to such maturity. Its breast we warrant would bear comparison with any beast in the land—low, broad, and full, with short neck, armpits matchless, hips firm and large, flanks grand, and back broad, straight, and even. Yet in some points it was deficient. Where, however, can you point out an animal, however surpassingly good, that is not? From the rump to the hucks he was short and rather dived, and the top of his shoulders would have given more general satisfac-

tion had they had a thicker coating of flesh. With this animal Mr. Stewart not only won the greatest trophy the society had to offer, but the first prize in his class of cross-bred oxen not exceeding four years old, where he beat Sir W. C. Trevelyan, who had a very nice level beast which, by the way, was one of the three that, by the accidental giving way on Thursday of the floor of the yet unfinished building where the show was held, suddenly fell, along with a dozen men or so, who at the time were examining the prize cattle, into some cellars underneath, eight or ten feet in depth; one gentleman, Mr. Robert Robson, who occupies a large farm at Newton-Morrell, receiving a compound fracture of the right thigh, and five others sustaining severe cuts and bruises in various parts of the body. But for this untoward event, the success of the show would have been complete, as at the time the pay-taker was taking as much as 20% in the hour, in shillings, for admission. It is, however, a consolation to think that the accident was not attended with fatal results, considering its frightful nature, and the fact especially that three huge prize bullocks fell in such unpleasant proximity, and in such dangerous confusion.

But, returning to Mr. Stewart's wonderful ox; it was the winner also of the tradesmen's cup, on the same ground that it obtained the challenge cup, namely, that it was the best ox in the show. Mr. Stewart was successful in gaining a first prize, too, with a cross-bred heifer, rising three years, where he had a formidable competitor, as may be judged by his taking the second to Mr. Jas. Reid, of Greystone, Scotland. The next most successful exhibitor was Mr. J. W. Pease, who not only got the tenant-farmers' cup value £10, with a very valuable Shorthorn ox, which was perhaps as good in condition as Mr. Stewart's, but was not so bulky, but with his tidy white Shorthorn heifer under three years old, which achieved for him at York last week so much fame, and won for him the choicest laurels offered by the society there, obtaining the first prize in her class and the tradesmen's cup as being the best heifer in the show. The same gentleman exhibited the best cross-bred heifer, which was in a condition which did him infinite credit, and he had the good fortune to carry off also a second prize. Mr. Reid was first amongst cross-bred bullocks under three years old; first also amongst Scotch beasts, the whole of the pure breeds being agglomerated in a mass—his was a Galloway, and it is no mean honour which he achieved in this class, considering that there were no less than ten entries, and that he was matched against foes as formidable as the Duke of Cleveland and Sir W. C. Trevelyan. He was first also amongst Scotch heifers, beating Major Gunter, and

eight others, whom the gallant Major led to the attack upon the head or a representative of the Highland clan of that ilk; while Mr. Reid, second with a good cross-bred four years old heifer, succumbing in this instance to Mr. Pease; and second with a three-year-old of the same species, here having to give way to his countryman, Mr. Stewart.

Mr. W. C. Trevelyan got four seconds—Shorthorn heifer, four years old; cross bullock of the same age; cross cow, and Scotch steer, being beaten in the respective classes by no one beyond the prize withheld by Mr. Stewart's ox, of which we have said sufficient, and by Mr. Reid. The other successes were the following:—Mr. T. P. Outhwaite, Goldsbro', Shorthorn oxen, three years old, first; Mr. Richard Abbs, Westholme, Winstone, second; Mr. R. Gell, Grimstone Lodge, who distinguished himself at one show by winning the Gold Cup, but who this year ranks only second for three-year-old Shorthorn heifers; Mr. Thomas Willis, Manor House, Carperby, Bedale, first, Shorthorn cow; Mr. John Fryer, Caterick, second; Mr. C. L. Wood, second, cross-bred steer, rising three years, Mr. Reid obtaining precedence over him; and Major Gunter, whose only laurel we have already indicated.

The sheep, we have already stated, constituted a very remarkable and attractive display, and were a principal feature of the occasion. Leicester shearlings: first, Mr. John Greaves, Clotherholme, Ripon; second, Mr. Francis Rickell, Warter. Southdowns: first and second, Lord Wenlock. Leicester and Cheviot shearlings: first, Mr. George Middleton, High Cliffe; as also second. Leicester and Blackfaced shearlings: first, Lord Wenlock; second, Mr. Middleton. Shearlings of any cross: first, Mr. Middleton; second, Mr. Robert Graham, Burton House, Staindrop. The Silver Cup, for the best pen of sheep in the show, was awarded to Lord Wenlock.

The pigs belonged wholly to the locality, neither Wainman of Carrheads, nor any other man of mark, attending. Still, the collection was very fair.

The grains and roots were fine rich samples, speaking volumes for the high cultivation of the district; and the poultry were as remarkable for quality as for numbers.

The judges were, for cattle and sheep, Mr. Joseph Currah, Branson House, Darlington; Mr. B. Wilson, Brawith, Thirsk; and Mr. John Angus, Whitefield, Morpeth. For pigs, grains, roots, bacon, and butter Mr. Thomas Wetherell, Durham, and Mr. T. Farrington, Hurworth. For poultry, Mr. E. Hewitt, Sparkbrook, Birmingham; and Mr. G. T. Andrews, Dorchester. For pigeons, Mr. J. W. Botcherby, Darlington.

THE ROYAL DUBLIN SOCIETY.—THE WINTER CATTLE SHOW.

The Winter Show of the Royal Dublin Society commenced on Tuesday, December 15, and continued to Thursday. In general the fat stock was only of a middling description, that is, considered as a Christmas show, and there was not that close competition for the premier prize of the exhibition—the 50-guinea challenge cup—which we have seen in Dublin. This was chiefly caused by Mr. Allan Pollok having sent his best cattle this year to Birmingham, London, and Liverpool, retaining only some ordinary beasts for the Dublin Show. Such a proceeding on Mr. Pollok's part was in a manner forced upon him. He had finally won the Society's cup last year, having competed for it successfully three years in succession, and he had this year replaced it with another of equal value to be competed for on similar terms. But he would not

become a competitor for it himself, and for that reason there was no occasion to keep his best cattle at home for exhibition. The absence of half-a-dozen of beasts of the class which Mr. Pollok has been in the habit of exhibiting, made a great gap in the show; but at the same time it rendered the general character of the exhibition more uniform than it has been in previous years.

Mr. Pollok's cup-winning beasts were crosses of the shorthorn and Galloway, against which even high-bred shorthorns, in the best possible condition, competed in vain, and the first winner of the new cup at Dublin last week, was also a cross-bred animal, but of a somewhat different description, being a cross of a shorthorn bull with a Hereford cow. This animal, which belonged to Mr. Gavin Low, a cattle salesman in the Dublin market,

took the prize as the best animal in a general section, comprising heifers of any age or breed, not competing in the other sections, and as the winner of the cup she was declared the best of all the fat cattle in any section. She was calved on the 10th of April, 1861, and presented a fine illustration of early maturity developed by generous feeding. She was, if anything, a little light in the thigh, and not quite perfect in the chine, but only to such an extent as would have passed unnoticed in an animal of less perfection. The next best animal in the Show was Mr. Richard Chaloner's shorthorn cow, Flora's Queen, which had of late refused to breed, and whose fine symmetry and beautiful quality, as well as prime condition, enabled her to win the first place as the best fat shorthorn cow of any age. The class of fat cows contained other high-bred animals, sent there chiefly for the same reason that induced Mr. Chaloner to put his cow in a Christmas Show; and this was not confined to shorthorns, for Mr. J. O. G. Pollok and Mr. Featherstonehaugh had two capital Hereford cows in the Hereford section, one of which had been bred at Cronkhill, and the other at Bedstone Hall, Salop. Both cows were highly finished, and while the judges gave the prize to Mr. Pollok's cow, they expressed their admiration of the other by highly commending her, being all they could do when there was only a single money-prize to award. There was only one Kerry cow exhibited, although it might be supposed that a Dublin Show would have been strong in this point. She belonged to Mr. Garnett, and though certainly very good beef, was not equal to some specimens of the same breed which we have seen at the Shows of the Royal Dublin Society. Mr. Allan Pollok won three first prizes in the heifer sections, that is, for the best shorthorned heifer, the best West Highland heifer, and the best Scotch-poll'd heifer, all under 4 years old. There was nothing remarkable about those heifers, or any of the others in the different sections, with the exception of Mr. Low's cup-winning heifer, which was entered in a general section, the rest being merely fair market beef. The entry of oxen was decidedly inferior to that of previous years, and every animal exhibited in the ox sections would have been better fitted for a show if they had been kept over until Easter. The successful exhibitors in those sections were Mr. Pollok, Mr. Barton, and Mr. Winter.

The show of sheep presented similar features to that of fat beasts, and, with a few exceptions, the occupants of the different pens were fair mutton and nothing more. The best sheep exhibited were Mr. Owen's aged Leicester ewes, which were very highly finished. Mr. Naper's prize pen of two-shear Shropshire weddles were also prime sheep; and the same may be said of his pen of two-shear crosses, between Scotch black-faced ewes and a Shropshire ram, although the judges did not give them the prize in the section in which they were shown. This was a general section made up of ewes and weddles of all ages, the prize being given to a pen of heavy three-year-old Ballinasloe weddles, belonging to Mr. Garnett. Surely the judges ought to have taken the quality of mutton into consideration, in a case of this kind, and also the difference in age, early maturity being, in our opinion, especially when combined with quality, a very material point. Mr. Broughton's prize shearing Shropshire weddles were good sheep of their age; and Mr. Frank's two pens of Leicester ewes, both of which were highly commended, were very fine. They were of the description of Leicesters which are bred in the South of Scotland and in Northumberland, and generally known as "Border Leicesters."

There were only a few swine shown, but there was not a bad one among the lot. The principal competitors, so far as prizes went, were the Misses Reynell, Mr. Naper, Mr. Reynell, and the Guardians of the North Dublin Union.

The show of poultry was the largest and best held in Dublin for a long time, while Mrs. Ferguson Blair, Balthayock Castle, Scotland, was a principal exhibitor, and we are glad to say also most successful. Several of the lots exhibited by that lady in the different sections were magnificent—particularly her Bramah Pootras, Dorkings, turkeys, and geese. Her lot of turkeys, over a year old, were truly splendid birds, and astonished all who saw them. The other successful exhibitors in the class were Mr. Williams, Mr. Boyle, Miss Drevar, Lord James Butler, Mr. Langtry, Mr. Rowland, of Chester, and Capt. Cole Hamilton. A large number of beautiful poultry was sent by the Commissioners of National Education, from the Albert Institution, Glasnevin. This collection not only got the prize offered for the best lot of poultry exhibited by a public institution, but was otherwise highly commended by the judges.

The show of farm-produce, which has always been a leading feature in the Dublin winter exhibitions, lost none of its attraction on this occasion. It was larger than usual—arising in a great measure from the competition caused by the presentation of a second cup by the firm of Messrs. Dickson, Hogg, and Robertson, Dublin, for the best collection of root-crops. That eminent firm has presented a series of cups for the same object to the society—that is, one last year, another for this year, and a third for the Show of 1864. The successful competitor last week was the Earl of Charlemont, through his steward, Mr. Brady, the collection sent by his lordship being both extensive and good. This is the second time that Lord Charlemont has won the cup, having been the successful competitor for it at last year's exhibition.

The collection of roots sent forward by Mr. Usher, Cappoquin, was considered so very good that the judges recommended it for a special medal, and Lord James Butler's collection was also highly commended, while that sent by the Guardians of the North Dublin Union, from their workhouse-farm, was commended. Certainly Mr. Usher's collection, as a show of roots grown on a farm, well deserved the special commendation it received; and the thanks of the society are undoubtedly due to the spirited donors of the cup, for the stimulus they have given to exhibitors in this department of the show. The stand of Messrs. Dickson, Hogg, and Robertson was most tastefully set out with a grand collection of coniferous plants, ornamental flower vases, and large roots, and formed a great attraction to visitors.

One of the most interesting objects in the exhibition of farm produce was a large collection of seedling potatoes, grown at the Society's Botanic Gardens, Glasnevin, by Dr. Moore, the talented curator of those beautifully-kept grounds. Sixteen of the kinds of seedlings exhibited are of Scotch origin, having been raised by Mr. Paterson, Dundee. They appear, for the most part, to partake of the "Kemp" strain, judging from their brownish white and roughish exteriors. They have only been grown one year in the Botanic Gardens at Glasnevin, where they were sent by Mr. Paterson to be tried. They are reported to have great constitutional vigour, and to have yielded good crops of excellent quality, particularly the kinds called Regents, Emperors, and Rocks. The Irish seedlings from the Botanic Gardens consisted of 39 kinds, all of which are fully matured. They were raised, about ten years ago, from seed, and have been grown in the Botanic Gardens ever since, where they have improved in quality up to the present time. Some are of the "Kemp" strain, while others are apparently more of the red apple. All the sorts possess a vigorous constitution, and yield crops of average quantity and of good quality. They seem, therefore, a most valuable lot to be distributed among growers throughout the kingdom.

The best sample of white wheat, which was exhibited by

Mr. Riall, weighed 62lbs. per bushel. The best sample of barley, exhibited by Mr. Trim, weighed 58lbs. per bushel. The best sample of white oats weighed 43½lbs. per bushel; so that there was nothing extraordinary in the weight of the grain sent for competition. The best beans, which were grown by Mr. Smith, County Wicklow, weighed 67lbs. The successful exhibitors of mangels were Mr. Forrest, Mr. Smith, Mr. Hutton, Lord Charlemont, and Mr. Barlow; of carrots and parsnips, Mr. Smith, Mr. Reynell, and Lord James Butler; of swedes, Sir St. Vincent Whitshed, Bart., Mr. Kenny, and Mr. Bland; and of flax fibre, Messrs. D. and W. Patton.

The show of butter was not large, but Mr. Patton's first prize tub was very good. Mr. Patton farms in Monaghan, which is a tillage county, but he nevertheless beats competitors from other counties where dairy farming is a speciality. Mr. B. Chaloner got the prize, as he generally does, for the best sample of Irish cheese. The prizes for wools, in the different sections, were taken by Dr. Taylor and Mr. Riall. Dr. Taylor also took the medal for the best selection of farm produce grown at the greatest elevation above the sea.

There is not room at the Winter Show for an extensive exhibition of implements; but Messrs. Ritchie, of Ardee,

were there with specimens of their ploughs, grubbers, and sowing machines; Messrs. Richmond and Norton, Liverpool, with their well-known chaff machines; Leverdun, Dublin, with firelay goods; as also Brown, Paisley; Worth, Oxford Street, London, with a variety of useful inventions for dairy, stable, and domestic purposes; Peare, Dublin, pumps; Bradford, Manchester, washing machines; Saunders, Dublin, hot-water-heating apparatus, boilers; Pickaley, Sims, and Co., Leigh, chaff cutters, &c.; Smith and Wellstood, Dublin, farm boilers, family cooking stoves; Healy, Dublin, a variety of farm tools; and J. B. Lawes, by his Irish agent, Mr. Rutherford, Dublin, manures and feeding stuffs.

The weather, fortunately, was fine throughout, and the attendance of visitors was therefore considerably larger than usual. We are glad to observe that a very decided improvement has taken place in the feeling with which its agricultural department is regarded by the Society, and we trust that the gentlemen who have charge of this department will find themselves in future heartily supported by the Society, instead of being impeded by the obstructiveness of an insignificant clique, who cannot see any good in anything in which they are not immediately concerned.

THE TREDEGAR SHOW.

The annual gathering of farm stock, which has been for so many years supported with princely liberality by the noble head of the Tredegar family, and which so pre-eminently deserves the title that has been often given it of the "Smithfield of the Principality," took place on Tuesday and Wednesday, December 15 and 16, in the spacious new cattle market at Newport. The entries were unusually large, numbering, for live stock alone, 289, the increase in the number of the horses being specially noticeable. Taken as a whole, the show was probably the best which has ever been held at Newport. Some of the classes for horned stock were remarkably good; but there was perhaps a more than usually large admixture of second-rate animals. Several of the classes, as we have before had occasion to notice, are what are called "open classes," i. e., any pure-bred animals may be shown in them. Thus Herefords may come into competition with short-horns, Devons, Sussex, or any other pure breed; but in each of these open classes the contest almost always lies between the two leading breeds, the Herefords, and the short-horns. We know that Herefordshire breeders are not very partial to open classes, but they are held to be well adapted for the Monmouthshire and South Wales district, and on that ground appear to be popular. The official catalogue shows 112 entries of cattle in the several classes. The Devons, being little bred in the district, were of course few in number, viz., 8 entries. The Herefords were represented by about 60 entries, and the remainder were Shorthorns, which did not thus show quite so numerously as their great rivals. Passing by the North Devons as a breed in which Herefordshire has little interest, we come to two classes for short-horns, one for yearling bulls and the other for two-year-old heifers, in each of which there were six entries, comprising among them some animals of great merit; Mr. Logan's prize heifer being specially noticeable for her large even frame and good character. The next two classes were for Herefords of similar sex and age, Lord Tredegar showing the same patronage to the white-faces as to the short-horns. In the class for yearling bulls, the competitors were—Mr. Duckham, Baysham Court, who was commended; Mr. Read, of Elkstone; Mr. John Jones, of Llwynyger; Mr. Rees Keene, Pencreg; Mr. Leyshon, Bridgend; and Mr. Thomas, St. Hilary, Cowbridge, who was the winner, in an average class, with a promising offspring of "Goldfinder the 2nd." There were also six competitors in the class for two-year-old heifers, viz., Mr. J. Taylor, Stretford Court, who was highly commended for a very neat heifer, showing a great deal of character and constitution; Mr. Read, Elkstone; Mr.

Jones, Llwynyger; Mr. Warren Evans, Llandowlas, commanded for one of the right stamp; Mr. Thomas, St. Hilary; and Mr. W. Tudge, of Adforton, Leistwardina, who took the prize with a superior heifer, showing, like Mr. Taylor's, a beautiful head and good symmetry and quality. This was a capital class. For Lord Tredegar's prize for the best fat cow, a very fair short-horn of his lordship's competed with and defeated a Hereford, of no great pretensions, shown by Mr. Keene, of Pencreg. In the class for fat cows, although an open one, the seven animals entered were all Herefords. The prize was deservedly taken by Mr. Bennett, of Ingatstone, near Ross, with a cow of great weight, her flesh being remarkably thick and firm, but scarcely good enough in quality to please the fastidious "toucher." Mr. Nett, of Glasbury, was highly commended for the cow which she showed at the late Hereford meeting—a very useful, well fed cow, a little deficient in goals and hardly up to the mark as a first-class show beast. She has, we were informed, been sold to a butcher at Hay, and will aid in contributing the supply of excellent Christmas beef which that town will no doubt exhibit. Mr. Farr, of Penyworlod, near Hay, showed an old cow possessing some good points; and the class, if not a very grand one, was at least a creditable one. The other exhibitors were—Mr. E. Francis, Goldcliff, Newport; Mr. T. Ll. Brewer, Danygraig; Mr. Jones, Llwynyger; and Mr. E. Leyshon, Bridgend. For Mrs. Leigh's cup for yearling heifers, the entries comprised five Shorthorns and two Herefords; the exhibitors of the latter being Mr. Bradstock, Cobrey Park, Ross, and Mr. Tudge, of Adforton. Mr. Bradstock's heifer was, however, not in its stall. Here the shorthorns carried the day, Mr. Logan, of Maindee House, being first and also commended for two very neat heifers. Colonel Wood's cup had four entries, two Herefords and two Shorthorns, and here the tables were turned; Mr. Pride, of Llanvihangel Roggeit, near Chepstow, being first with a very nice yearling heifer, the other Hereford exhibitor being Mr. Jones, of Llwynyger. For Mr. Rennie's cup for two years old heifers there were three competitors; Mr. Logan, first with a Shorthorn; Mr. Thomas, St. Hilary (commended), and Mr. Jones, Llwynyger, who did battle unsuccessfully on behalf of the white faces. Passing by some classes in which the entries were small and exclusively short-horn, and presented no feature for special notice, we come to the West of England and South Wales District Bank prize for the best bull calf. In this class there were five entries of Shorthorns and ten of Herefords. The latter, with a preponderance of 2 to 1 as to number, were also distinguished as the

ground of merit, as they took the prize and a first and second class commendation. Mr. Taylor, of Showle Court, won the cup with a ten months and three weeks old calf by his Royal prize bull "Tambarine." This offspring of "Tambarine" out of "Dewall" was the winner of the first prize in his class at the last meeting of the Gloucestershire Society, held at Cirencester. He shows a great deal of the thick and level character of his sire, and has the "Carlisle" head, with a white mane, which Mr. Taylor traces through his dam to the "Magnet" cross. In a very fair class, the son of "Tambarine" is held to be deservedly entitled to the position of honour which he occupies. Mr. Thomas, of St. Hilary, was highly commended for a promising calf by "Goldfinder the Second;" and Mr. Rees Keene was commended. The other local exhibitors were Mr. Bradstock, of Cobrey Park; Mr. Powell, of Llantilio, Abergavenny; Mr. Pride, Llanvihangel Roggieth, Chepstow; and Mr. Davies, Langstone Court, Newport. In the next class—the Rev. Thomas Protheroe's cup for heifer calf—the Shorthorns were 5 to 2, and Mr. Logan was first and highly commended; Mr. John Wigmore also getting a commendation with a nice heifer calf by "Speculator," out of his "Stately the Third." Mr. Warren Evans, of Llandowlas, was the other Hereford exhibitor. The great prize of the meeting is the Corporation Plate for the best steak bull, cow, or heifer, to be exhibited under certain and specified conditions. There are only four entries in the catalogue, viz., Mr. William Taylor's bull, "Tambarine;" Mr. R. Leyshon, of Bridgend, a Hereford cow; Mr. Rees Keene, Pencreeg, a Hereford bull; and Mr. John Wigmore, a Hereford cow; but all the animals in the yard, whether entered or not, that come within the specified conditions, are eligible for competition, so that it is a somewhat difficult matter to ascertain what animals really compete for this handsome prize. The official return placed Mr. John Wigmore's magnificent heifer "Stately the Third" at the head of the list. As an animal displaying great scale, character, symmetry, and quality, Mr. Wigmore's heifer is certainly a "gem of the first water," with as few defects as one can well hope to meet with. Already heavily wreathed with the laurels of victory, having won first prizes at Cirencester and Monmouth in the bull, cow, and offspring classes, and at Monmouth and Ross, in the breeding-cow classes, she has now given additional renown to the Weston-under-Penyard herd. We may just add that "Stately the Third" is by "Forester" (1238), bred by Captain Power, of the Hill Court, Ross; her dam being "Stately," bred by Mr. J. Jones, of the Hallow Farm, Dinorad, and successfully exhibited by Mr. Wigmore at the Gloucestershire and Ross shows, in 1860. We want more cows of "Stately the Third's" scale and character; and, while congratulating Mr. Wigmore on his successes, we trust that her progeny will turn out equally well. We learned, from a private source, that the final contest lay between Mr. Wigmore's cow and Mr. W. Taylor's bull "Tambarine" and his bull-calf, the winner of the prize given by the West of England and South Wales District Bank. "Tambarine" was greatly admired as an uncommonly thick-fleshed and level bull, though he does not appear to carry so much flesh as when exhibited at the Hereford October show, since which time he has been doing a great deal of work among his worthy owner's herd. The prizes for fat cows, in singles and pairs, produced some fair animals from the ranks of the Herefords and some indifferent shorthorns. Mr. Rees Keene's Hereford cow drew much attention, from her great weight; but her quality is not of the best class. Among the two years old steers and yearling heifers for the subscribers' prizes there were some good, but not very grand animals, all of which were Herefords. The last class for cattle—bull, cow, and offspring—was an open one, but the lots entered (six in number) were all Herefords. The exhibitors were Mr. Rogers, All-yr-Ionis, Abergavenny; Mr. Higgins, Woolston Grange; Mr. W. Harris, Llanhennoek, Newport; Mr. Dowle, Clarypit Farm, Chepstow; Mr. Warren Evans, Llandowlas; and Mr. Thos. Thomas, St. Hilary, Cowbridge. A noticeable feature of this class was the unequal merit of the animals. For instance—as was remarked by one of the judges at the dinner—in one lot there was a good bull, a bad cow, and an indifferent offspring, and in another a bad bull, a good cow, and a middling offspring. The judges had thus a good many points to balance, and they finally awarded the prize to Mr. Thomas, who showed the celebrated bull "Goldfinder the Second" (959), bred by Mr. Parry, of Choletrey, and sold by him to Mr. Price, of Pembridge, who disposed of

him to his present owner. "Goldfinder the Second" was first in his class at the Royal, at Chester, and has gained prizes almost innumerable. Although now nearly twelve years old, he retains the form of a grand Hereford bull, with great scale and excellent character, which is transmitted to most of his progeny. The heifer shown by Mr. Thomas, as also the offspring, are both by "Goldfinder the Second." Mr. Warren Evans, of Llandowlas, obtained the second honours, his bull being the one which has taken prizes at the Abergavenny and other meetings this year. Mr. Rogers, of All-yr-Ionis, was commended. Mr. Higgins's bull has great scale; but being low in flesh, he appeared somewhat disadvantageously, and was not very well supported. Mrs. Dowle's animals were not in the stall according to their number. The Extra Stock Department, which at some shows constitutes a very large and interesting feature, is at Newport almost nominal—a circumstance which is no doubt attributable to the extent and variety of the classes.

There were forty entries of sheep, of which the longwool ram lamb class had no fewer than thirteen. In the other classes, with the exception of those for mountain breeds, there was not very great competition. The show of "mountainers" was remarkably good.

There were 27 entries of pigs; and a finer show of members of the porcine family, whether for breeding purposes or for slaughtering, has rarely been seen.

The show of horses was an unusually large one, the catalogue having no fewer than 110 entries, thus classified—yearling cart colts or fillies, 4; three-year-old ditto, 7; four-year-old ditto, 2; cart mares and foals, 8; entire cart horses, 6; nag mares, for general purposes, in foal or with colts at side, 10; ponies under four years old, 10; cobs, bred in the county of Monmouth, Glamorgan, or Brecon, 19; brood cob mares, 15; yearling colts or fillies by thoroughbred horses, 9; three-year-old ditto, 11; four-year-old ditto, 4; weight-carrying hunters, under seven years old, 4; entire thoroughbreds, 5; extra stock, 1. The horses exhibited at the Tredegar show have never held a very high position in the opinion of the best judges, and for some time past the Hon. Godfrey Morgan, Mr. W. S. Cartwright, and other gentlemen who are great sticklers for purity of breed, have tried zealously to effect an improvement. In some of the classes the present show, on the ground of merit, was much in advance of any one of its predecessors; but there were nevertheless many animals in the yard which had not the slightest pretension to be placed in the category of mediocrity, and which doubtless puzzled the judges—if they had any time to entertain such a consideration—in solving the problem of the "why and the wherefore" of their being sent into the yard. With such a long list of entries, it is of course impossible to go into many details. We must content ourselves by stating that the classes for yearling and three-year-old colts or fillies by thoroughbred horses were much the best in the yard, each class producing some very superior animals. Mr. W. S. Cartwright was fortunate enough to take the prize in each class; in the yearlings with a remarkably handsome filly by Gemma-di-Vergy out of Kilmenny, and which has been named "Lady Tredegar;" and in the other class with a well-furnished colt by Barnton out of Twelve-stone-two. The cobs produced nothing very grand, although very numerous. Among the cob brood mares, Mr. Harris's first prize animal was very much admired. The judges awarded the prize given by Mr. Currie, of Itton Court, for the best four-year-old colt, filly, or gelding, by a thoroughbred horse, to Dr. Smythe, of Abergavenny; but the horse was subsequently disqualified on the ground of his sire, Gamecock, being a halfbred, and the prize was taken by Col. H. Gore Lindsay, of Brecon, with a horse by Deffance, which had been commended. The entire thoroughbreds shown for Mr. Cartwright's prize were not quite of the best stamp, but the judges thought Mr. G. H. Williams's Francatelli, by Sweetmeat, good enough to justify them in awarding the cup. There were five entries, but we could see only two other horses in the yard on Tuesday, viz., a four-year-old by West Australian, out of Harriet by Pyrrhus the First, the property of Mr. John Clayton, of Cheltenham, which, though neat, lacked substance; and a bay horse, Kildonan by Newminster out of Shamrock, which was shown by Mr. Griffiths, of the Aubrey Arms, Bonvilston, and was a good deal fancied. Among the horses for draught purposes there was a few good ones, and several bad ones. Considering the great de-

mand there must be in Monmouthshire and South Wales for first-class draught horses, and that good prices are now obtainable, there is room for something better to be yet produced.

The judges for the horned stock, sheep, and pigs were

Mr. W. Carr, Stackhouse, Settle, Yorkshire; and Mr. T. Rea, Westonbury, Pembroke, Leominster; assisted by Mr. J. Burlton, Luntley Court, Pembroke, Leominster. Judges for the horses, Mr. R. Chapman, Cheltenham; and Mr. D. Baker, Chapstow.

THE YORKSHIRE SOCIETY'S FAT STOCK SHOW.

On Wednesday and Thursday, December 2 and 3, this society held their winter exhibition of fat stock, poultry, and roots. The general appearance of the show was imposing from every point at which it could be witnessed, the splendid and numerous animals exhibited, and the extensive and beautiful decorations being gratifying to the eye of the spectator, and highly creditable to the society. The buildings were warm and comfortable for the reception of the public, and the stock was studiously cared for. Whist supplied with abundance of food and water, the animals were kept in a cleanly state, the whole of the arrangements agreed upon were admirably put into execution, and an air of joy and gladness prevailed the entire scene.

The following were the judges for Cattle: Mr. B. Wilson, Brawith, Thirsk; Mr. J. Wood, Stanwick Park, Darlington; and Mr. W. Dobson, Newcastle-upon-Tyne.

For Sheep and Pigs: Mr. J. Borton, Barton House, Malton; and Mr. J. Walsley, Rudston House, Bridlington.

AWARD OF THE PRIZES.

CATTLE.—SHORTHORNS.

Best ox, not exceeding four years old, £10, Mr. J. W. Pease, Woodlands, Darlington. This animal also obtained the President's Cup, as the best animal in the cattle classes. Second, £5, Mr. F. Carr, Heslington. Highly commended, Lord Kinnaird, Russis Priory.

Ox, not exceeding three years old, £10, Mr. J. Barnitt, Birdforth; second, £5, Mr. J. R. Singleton, Givendale. Commended, Mr. J. Hannam, Kirk Deighton.

Cow, having had one living calf, £10, Mr. Chas Watson, Seaton Ross; second, £5, Mr. Wm. Holland, Lightcliffe.

Heifer, not exceeding four years old, £10, Mr. A. Macbean, Carlton; second, £5, Mr. Francis Carr, Heslington. Highly commended, Mr. C. Weddall, West Bank; commended, Sir W. C. Trevelyan, Bart, Wallington.

Heifer, not exceeding three years old, £10, Mr. J. W. Pease, Woodlands; second, £5, Mr. Robt. Gell, Grimston. This animal also carried off Mr. Simpson's cup. Highly commended, Lord Feversham, Duncombe Park.

OTHER BREEDS.

Polled Scotch ox, £5, Mr. J. Reid, Graystone, Alford, Aberdeen; second, £2, Sir W. C. Trevelyan, Bart.

Polled Scotch cow or heifer, £5, Mr. J. Reid; second, £2, Sir W. C. Trevelyan, Bart. Commended, Mr. Thomas Lund, and he also obtained Mr. Simpson's cup.

Highland ox, £5, the Hon. Admiral Duncombe, Kilwick Percy.

Highland cow or heifer, £5, Major R. Gunter, The Grange, Wetherby; second, £2, Sir W. C. Trevelyan, Bart. Highly commended, ditto.

Irish cow or heifer, £5, Mr. Jacob Stephenson, Newton Kyme; second, £2, Mr. J. A. Smith, Tadcaster. Commended, Mr. John Cundall, Askham.

CROSS BREEDS.

Ox of any age, £5, Sir W. C. Trevelyan, Bart.; second, £2, Mr. John Clarkson, Cobdale. Highly commended, Mr. T. Robinson, Wingate Hill.

Cow or heifer of any age, £5, Lord Lonsborough, Grimston Park; second, £2, Mr. James Reid, Graystone. Highly commended, Mr. T. Robinson, Wingate Hill; commended, Sir W. C. Trevelyan, Bart.

TENANT FARMERS' CLASSES.

Ox of any breed, £5, and the Ex-Sheriff's cup, Mr. G. Clark, Bilton; second, £2, Mr. S. Wiley, Bransby. Highly

commended, Mr. T. Hill, Wetherby; commended, Mr. James Hepstonstall, Hazlewood.

Cow of any breed, £5, Mr. J. Radcliff, Stearnby; second, £2, Mr. Thos. Hill. Highly commended, Mr. J. Charlesworth, Headfield.

Heifer of any breed, £5 and Lady Trevelyan's cup, Mr. M. Tomlinson, Crowthorpe; second, £2, Mr. C. Watson, Sowerby. Highly commended, Mr. M. Stephenson, Fourstones, Hexham; commended, Mr. R. Loithouse, Bishopthorpe.

EXTRA STOCK.

The Hon. Admiral Duncombe, £2, for a roan ox, five years old.

SHEEP.—LEICESTER.

Pen of three wethers, under 22 months old, £4, Mr. G. L. Fox, Bramham Park; second, £2, ditto. Highly commended Mr. John Lee, Gardham.

OTHER BREEDS.

Pen of three south or other down wethers, £3, the Hon. Admiral Duncombe; second, £1, ditto. Highly commended, Lord Wenlock, Escrick Park.

Pen of three horned Scotch or Mountain wethers, £3, and second, £1, Major R. Gunter. Commended, Mr. Wm. Swale, Great Smeaton.

Pen of three wethers, of any cross breed, under 22 months old, £3, Mr. Thomas Robinson; second, £1, Lord Wenlock. Commended, Lord Kinnaird, Russis Priory.

EXTRA STOCK.

Messrs. W. and F. Coulson, Gatenby Farm, £1, for five Leicester ewes, 3 years old.

Mr. J. Lee, Gardham, 5s., for a three-shear ewe; and 5s., for wether, 20½ months old.

PIGS.

Pig, large breed, of any age, £3, Mr. J. Fisher, Gillygate, York; second, £1, Mr. G. Bell, Statton. Highly commended, Mr. J. Smith, Hunslet.

Pig, small breed, exceeding 12 months old, £3, Rev. F. J. Gruggen, Pocklington Grammar School; second, £1, Mr. George Mangles, Givendale.

Pig, small breed, under 12 months old, £3 and Mr. Hill's cup, Mr. Peter Walker, Heslington; second, £1, Mr. W. H. Hick, Taaner Row, York. Commended, Mr. G. Mangles, Givendale, Mr. J. Wrigglesworth, Murton, and Mr. C. Tonge, High Catton.

Pig, middle breed, exceeding 12 months old, £3, Mr. J. Hickman, Hull; second, £1, Mr. T. Marwood, Boston Spa. Highly commended, Mr. H. Dudding, Haxby; commended, Mr. C. Cook, Goodramgate, York.

Pig, middle breed, under 12 months old, £3, Mr. Henry Dudding, Haxby; second, £2, Mr. Hill, Wetherby. Highly commended, Mr. T. Hill.

Pen of three pork pigs, under four months old, £3, Lord Wenlock; second, £3, ditto. Commended, Mr. W. Hornsey, York, and Mr. W. Fall, York.

EXTRA STOCK.

Sir G. O. Wombwell, Bart., Newburgh Park, 30s., for three pigs, small breed, 11 months old.

Mr. Henry Whittaker, King's square, York, 5s., for a pig, 17 months and 2 weeks old.

Mr. Jos. Carey, Heslington, 5s., for a pig, 1 year and 19 weeks old.

STEAM DIGGERS AND DELVERS.

TURN-SPIT DELVING is the subject of this paper, or spade husbandry by steam-power. Up to this date the proposition has not been successfully reduced to practice, so that the object we have in view is similar to what it was in the case of the rotary class of diggers examined in our last or second article under the above heading; and we may further promise that much of what was stated on that occasion is applicable to the present, to relative defective delving mechanism, and also to the improvements necessary to attain to successful practice in the field.

Digging with a spade or fork, when properly performed, is unquestionably first-rate tillage, possessing a decided superiority in many respects, as formerly stated, over the best work done by the plough as at present constructed. But while this is acknowledged, it must at the same time be observed in this place that there is less difference between the principles of cultivation on which the two works are executed than is perhaps generally credited. In point of fact, both works may justly be said to be performed on the principle of inverting the sod, for the furrow-slice in ploughing is neither more nor less than a spit or sod turned upside down, so that the difference lies in the more perfect manner the sod is turned by the spade. Such being the case, it naturally follows that if the steam-plough shall be so improved in mechanism as to make an equal quality of work to that now done with the spade, spade husbandry by steam may lose much of its present popularity in the estimation of its warmest advocates. But if such is the conclusion, when the subject of cultivation or the quality of the work done is examined exclusively from an agricultural point of view, it naturally follows, on the other hand, when it is examined from a purely mechanical point of view, that if such is the action of the plough, can we take a lesson from it in the improvement of our steam-delvers, and by such means keep spade husbandry in advance, so that steam delving shall be then as much superior to hand-delving as steam-ploughing now is to horse-ploughing?

This hypothetical conclusion is a perfectly legitimate one, and we have introduced it expressly for the purpose of reminding those of our readers who ride our present hobby-horse (steam-delving), that the old controversial question of the spade versus the plough is not a finally settled one, but the contrary—further from being solved in favour of the former (the spade or fork) than ever, although our piped delvers have, at present, best horses out of the field triumphantly. Such being the actual position of the two rival systems, it is manifest that turn-spit delving by steam must, like rotary digging, be looked upon as an exceptional practice for special circumstances, as market gardening, and not as a general rule in agriculture. But, in granting this, we must, on the other hand, again remind the out-and-out advocates of the plough that since their favourite system is not adapted for the exceptional cases in question, it consequently follows that the complaints of their opponents at the present time are well founded relative to their wants not being supplied, it being all the more the imperative duty of the mechanical world and the agricultural press to discuss the subject of steam-delving, because it is the exceptional practice—the weaker party being always entitled to special sympathy.

The solution of the problem of steam-delving turns upon the following two fulcra—a traction-engine, with digging apparatus, specially constructed for market gardeners, and others requiring the regular employment of such; and a digging apparatus, that can readily be attached to the portable engines now being used by landowners and their tenants, in threshing, ploughing, &c., &c. Both propositions may be discussed together.

In the olden time of exclusive common-road conveyance, the horses required by the market gardener, in carting his vegetables to market, and in fetching home manure in return for the land, were amply sufficient for the purposes of ploughing, harrowing, and other field operations; but now, that all our large towns are being intersected and literally checked with railroads, and that the latter are bringing in the produce

of market gardeners, and conveying all the manure to the country, at a fraction of the expense such work can be performed by horses, and that the works of distribution of vegetables and of the collection of manure are being more economically and better performed by the carts and vehicles of salesmen, greengrocers, and general and special contractors, the position of the market gardener is very different; for his expenses in keeping horses in the immediate vicinity of towns are very great, while horse-ploughing has become old-fashioned, even in this somewhat patriarchal department of the world as regards teams, plough-gear, and other chattels of tillage. Such then being his position, it naturally follows that if he can get a steam-delver to do his work much cheaper and better than his out-of-date cattle and implements, the proposition will not be without its attractions to him. And besides tillage, the digger may be detached from the engine, and pumping apparatus put on, so as to apply water or liquid manure to the land; and important as both these considerations are, there is another of perhaps still greater weight, for farmers and landowners at a distance from town now begin to find that with artificial manures and railway conveyance, potatoes, corn, and hay are not the only products of the vegetable kingdom they can profitably send to market, and that articles not overforced when thus grown in the pure air of the county will always meet a ready sale. Now, of all things, competition of this kind is the most powerful monitor in effecting changes of the kind contemplated, by sweeping helter-skelter old out-of-date trash to the shades of oblivion; and by satisfying the most antiquarian of the old school that the only rule of safety in such cases is to keep pace with the times.

With these premises before us, we now come to the mechanical problem of automatic turnspit action. That steam will be willing and ready to do its part in the performance of the work, no one need raise a doubt who knows anything about its qualifications as a prime mover. Of the many propositions hitherto enunciated, we shall only quote one as an example, and that one from the Journal of the Society of Arts, Feb. 1, 1856 (Appendix to Fowler's paper on "Cultivation by Steam—its Past History and Probable Prospects"): "It has," says the writer, "been proposed to dig land on the principle of the steam-hammer. Suppose a series of oscillating cylinders constructed on the principle of the steam-hammer; but instead of the hammer a large fork, with a swivel action on the piston-rod for turning off the spit. You will readily perceive that it would not take a vast amount of engineering to make the steam drive the forks into the ground, lift them out by one crank shaft motion, turn the fork by a second on its swivel, advance another step by intermittent progressions, and so on. All this is plain sailing, at least upon paper."

The practical objection to the above as a rudimentary idea is the intermittent progression of the steam-horse. In our second article it was shown that the engine under rotary cultivation should be kept moving. In other words, the progression of the engine or prime mover must be continuous, but that of the fulcrum of the digging apparatus intermittent.

In further illustration of this, let us briefly examine the movement of the labourer in digging with a spade or fork from a mechanical point of view. In this case, the ground under the foot on which the delver stands is the common fulcrum to the system of levers in operation while he is driving his spade into the ground; but when he begins to loosen and lift the spit, and turn it over, the weight falls upon both feet, so that the ground under the two is then the fulcrum. Still the principal weight is upon the foot first mentioned, each being the left or right foot, according as he is moving to the left or right, or is right or left-handed. Gardeners and good workmen learn to use both hands equally, and thus shift hands alternately. In the cases under notice we shall suppose the delver is standing on the left foot, his right foot, with which he is driving in his spade, being the one that is shod with the foot-iron. Such, then, being his position, the moment he

turns the spit into its place, and rectifies anything that is wrong with the surface so as to give his work a workman-like appearance, he throws his weight upon his right foot in order to shift the left on to a new fulcrum, to enable him to take on a fresh spit.

The reader who has been able to follow us in this short but imperfect sketch of the *modus operandi* of the natural delver in digging, will perceive that each foot, with the fulcrum under it, has its special function to perform—the left foot and its fulcrum, when he is driving in his spade and turning the spit, and his right foot and its fulcrum when he is shifting his position backward a short step, equal to the breadth of the spit, to take on fresh ground.

The question as to how closely these data relative to the function of the delver's feet and fulcra under them coincide with the true fulcra and action of an *ever-lever*, formerly introduced under rotary diggers, may safely be left in the hands of inventors. That an endless rack platform may be made to move in the opposite direction of the engine, and at an equal velocity, so as virtually to be at rest on the ground site, and thus serve as a fulcrum, is a problem which in principle has already been solved by one of the fathers of steam culture—*vis*, Heathcoat. And besides a travelling platform as a stationary fulcrum, another plan has also been solved, at least so far as principle is concerned, *vis*, the old proposition of crutches behind traction-engines; for broad shoes like those of Boydell's wheels upon the crutches may be made the fulcrum to the artificial delver.

Again, if an *ever-lever* can be worked so as to keep pace with the periphery of the toothed or ratchet revolving wheel upon which it works, mechanism similar in principle can be worked along a horizontal rack, and, in point of fact, travelling cranes have been so worked forward in more ways than one.

An objection may here be raised, that in either case, but more especially in that of the endless platform, the fulcrum as proposed would stand in the way of the diggers. In other words the land under the endless platform or shoes of the crutches could not be dug. But such can readily be tossed to the wind, for it is not special mechanism that we are discussing, but the principles which such involve. Now, the principle in question is simply this: that the fulcrum of the digger shall move backward at a velocity equal to the speed of the engine, so that it may remain virtually at rest perpendicularly above the land to be dug, so that if we suppose a four, five, or six-inch breadth of spit, according as may be the depth, then all that is necessary is to give the fulcrum-carriage a short horizontal motion backwards and forwards of from four to six inches—*i. e.*, backward when the spade or fork is being driven into the ground, lifted, and turned over in depositing the spit in its proper place; but forward in the other movement, when taking on fresh ground, exactly similar in principle to the two movements of the labourer. And besides, endless travelling platforms may be raised sufficiently high to be dug under, or the digging apparatus may lie in its rear.

Having thus got a fulcrum for our turnspit automaton, we have next to examine the peculiar mechanism required to perform the inverting process, and this brings us to the principles involved in the characteristic twist of the labourer's elbow, in comparison with what we see exemplified so unostentatiously in the more simple action of the turnover of a plough. And besides the general routine followed in either case, there are in both more ways of turning the sod than one. In the case of the spade, for example, the spit may be wholly turned round, or only half round, being thrown upon its edge: or it may be inverted in the trench on a third plan differing from the previous two, more especially as to the peculiar mechanism required to perform the work artificially; the mouth of the

loaded spade being only lifted to the top of the face of the trench opposite the delver, and then pulled from under the sod, the latter being kept in its place by the foot when it does not leave the spade freely. This latter plan is not unfrequently resorted to by beginners, before they have learned the art of handling the spade successfully, especially when the soil adheres to the implement. It is also adopted by lazy workmen, to avoid lifting the spit to the height required under the first plan, and throwing it off with a thrust. As to the quality of the work done under each plan, that, as a question of principle, may be thrown overboard without ceremony; for although in practice the odds are in favour of the first and second plans, that is more due to artistic skill acquired from experience, and better adaptation to be thus performed by the peculiar mechanical economy of the human frame, than to any difference of principle in the mode of cultivation. In point of fact there is no difference in the principle of cultivation, for work of as good quality may be performed on the latter plan as on the former two, although not so easily done by human labour. But this latter, the reader will perceive, is no argument when brought against machine-delving, for its contrary may be true.

But how, it may be asked, is the spit to be removed from the steam spade, unless it is turned over, as in the case of the labourer? This, however, may be at once disposed of satisfactorily, for the labourer's spade requires something more than merely turning over, a good firm shake or thrust being absolutely necessary to clear it when the land is wet and adhesive. Now, as provision must always be made for the more difficult examples of practice, and as the labourer, in sticky tenacious soils, is often obliged to apply his foot under the third plan in question, it follows, as the legitimate point of inquiry, is not this latter, then, the peculiar plan that should be adopted in the construction of steam delvers? And cannot this be easily effected by a sort of spade or fork cleaning apparatus, which may consist of a simple slide down counteracting fork, to prevent the spit from being drawn backwards and downwards into the bottom of the open trench in the process of withdrawing the spade, exactly as is experienced when a trial is made to dig land on this plan, as we have done, and as our interested readers should do by way of experiment? And would not mechanism of this kind be more simple in its construction, more effective and durable in its operation, and much cheaper, than the crank and swivel-turning plane of the numerous patent projects hitherto proposed for steam delvers?

To those of our readers who may not feel disposed to answer the above in the affirmative, we may observe that apparatus for cleaning the steam spade may be introduced under the second plan of a half turn twist of the handle, and that it could be removed when the quality of the soil did not require such a provision.

As to a cross between the plough and the spade, we have not room left to say much on the matter. Crossing the breed has certainly become more than a favourite theory amongst practical farmers, but the proposition of a half-bred steam-horse requires a second consideration before it is finally adopted. Rotary ploughs have been tried, and various plans of screwing apparatus proposed, but both are deficient of the delving element. At the same time each obviously evinces a change in the right direction. Can we therefore cut our sods to the proper depth, and length, and breadth vertically from above, and then turn them over by a series of screws worming their way like truss talpas, each up its own furrow, keeping pace with the prime mover, and turning its sods over with the open furrow on its right or left as the case may be, and from headland to headland without intermission?

ENGINEER.

FEEDING STUFFS.

At the first monthly meeting of the Winfrith Farmers' Club, after the "harvest vacation," Mr. W. C. Spooner, of Eling, near Southampton, had undertaken to introduce a discussion "On Feeding Stuffs—their relative properties and uses."

The CHAIRMAN said he was happy to state that the blank

in their card had now been filled up by Mr. Spooner, who had accepted the invitation of the club to come and give them a few observations on a question of very great importance to agriculturists.

Mr. W. C. SPOONER said: Mr. Chairman and Gentlemen, —I must apologise for what I am sure you will find a very

imperfect lecture, if lecture it can be called; but I must plead as my excuse the shortness of the notice I have had, and having been engaged in other occupations, I have not been able to find time to commit my notes or my observations to paper, as I should like to have done, at any rate to a limited extent. It cannot be said the subject selected, "Feeding staffs—their relative value and uses," is one of little importance or of little interest to the community at large or the body of practical agriculturists themselves. When we look at the statistics of the country and find the enormous amount of animal food that is pertaken by the population of these islands, it is a matter no longer of surprise how great the occupation must be that supplies this food, and how important it is to the best interests of this country—I may almost say, the best interests of humanity—that this should be fully supplied. Every now and then there are abortive attempts to enforce the principles and inculcate the doctrines of the vegetarians. We sometimes find some elderly gentleman coming forward and telling his audience that he has managed to go through the world up to that time without partaking for many years of animal food; and sometimes men come forward and offered themselves as practical proof of the advantages of a vegetable diet, although those who saw them sometimes complained of a paleness and pallidness of cheek, but yet they manfully maintain that it is a great error to eat any animal food at all. We, however, know that there is no truth, either in agriculture or philosophy, that could be supported, if it depended upon the exceptions alone. Exceptions may prove rules, but exceptions never proved that they were themselves rules; and that is the case with regard to a vegetable diet. Some years since, when English contractors were called to France and other parts of the continent in order to make railways, in which the French at that time had had very little experience, the men engaged were partly English and partly French, and it was found then practically the case that it took two and a-half Frenchmen to do the work of one English navigator. Although this might in a small degree be attributable to the superior skill of the one over the other, yet it mainly depended on the fact that the one subsisted largely on animal food, and the other on vegetable diet, for it was found afterwards, when the Frenchmen were taught the use of beefsteaks, they very soon acquired very great additional strength. Therefore it is of the utmost importance, if we wish to maintain the stamina of our country, if we wish our soldiers and sailors should fight our battles well for us, if we wish our artisans should perform a proper amount of work—it is of the utmost importance that an abundance of animal food should be supplied for their use. If that is the case, then it must be of very great importance to ascertain something like the proportionate amount of vegetable food that is required to make a given quantity of animal food—to ascertain, if we can, by practical example, how best these various foods can be combined to produce the greatest effect on the animal with the least effect upon the pocket. In treating of any food, it is generally divided by chemists into two or three what may be called proximate principles—that is, the last combination which the different elements assume before combining in the form of food. Each of these proximate principles themselves might be capable of separation by analysis into a number of others; therefore when we use this term we apply it to the form the substances assume immediately before coming to food. It is well known that in vegetable food there are three or four different principles. The one of the greatest importance, we may almost call it, is the albuminous part—that which may become flesh or muscle itself. We limit our term to that of albumen for the sake of avoiding complicated details, although there are various words, such as the caseine and peptine compounds used by chemists, to express that principle of food which can be converted into flesh and muscular fibre. It differs from the other elements of food, inasmuch as it contains one particular principle, one particular element, that is, nitrogen. Whereas flesh possesses nitrogen in addition to carbon, hydrogen, and oxygen; fat, starch, sugar, and vegetable fibre do not possess this particular and essential element. Therefore one is called nitrogenous food, and the other is called carbonaceous food, or food for respiration, signifying the principal object to which it is applied—the supporting of the animal heat or respiration, and the power which it possesses of making fat; it mainly consists of carbon. Thus we have the albuminous or flesh-making elements, and another class, starch, gum, and sugar. Now starch, gum, and sugar differ from each other in the respective elements they may be composed of, but not

in the nature of those elements themselves. For instance, both starch, gum, and sugar are composed of carbon, hydrogen, and oxygen; but whilst sugar contains 40 per cent. of carbon, starch contains 44 per cent., and fat or oil about 78 or 80 per cent. of this constituent, being not only the material for preserving the animal heat, but that which can be converted into the fat of the body. We have also a distinction made by chemists of vegetable fibre; for although this vegetable fibre may consist of the very same elements as fat, starch, &c., yet it is important to distinguish it, not only because it contains these elements in different proportions, but still more, because we know the greater part of vegetable fibre is not capable of nourishing the body; the greater part of vegetable fibre passing through the body without contributing anything to its nourishment. We have in addition to this the ash. It is well known that if we burn a piece of straw or flesh we cannot burn the whole; although the greater part will be converted into its elements and take the form of gases, which mix with the atmosphere, yet there is some part remaining, and that is called the ash. The per-centage is very small, about 2 per cent. in wheat, and about 4 or 5 per cent. in cake of different kinds. But although the quantity of this ash is so small, it is of extreme importance; it contains in the earths a greater number of bodies than the organic part which forms the principal bulk; and it is of importance, inasmuch as it makes the strongest fabrics of the animal itself, bone being formed of the ash of plants. Now it is very interesting, when we know how very varied are the proportions and percentages of these different elements in various foods, to ascertain and to keep in remembrance the different properties these elements may individually or collectively possess. But before entering upon this point, perhaps it will be well to glance for a few minutes at the construction of the digestive organs by which the changes in the food are produced. The animals we are called upon to feed are principally oxen, sheep, and pigs. The digestive organs of each of these animals differ materially from each other. Indeed, there is a much greater correspondence between the digestive organs of the pig and the human subject than there is even between those of the pig and the sheep or ox. There is not a very great difference in the anatomical construction of the digestive organs of the ox and the sheep; the great difference really consists in the intestines, which may be considered of somewhat greater importance in the sheep than in the ox. In the ox the stomach is of vast power as well as of increased relative size, and thus that animal is capable of digesting a greater proportionate amount of vegetable fibre, and is constituted to support life better than the sheep on straw and coarse hay. This is principally owing to the strength and power of the first stomach. Otherwise there is no very great difference between them. Mr. Spooner then exhibited an outline of the stomach of the sheep, and explained the various parts and the functions which they performed; also noticing the peculiar power possessed by the ox and sheep of bringing back its food for remastication, after which he proceeded: I should have observed that, previous to passing into the stomach, the food is mixed with a large quantity of saliva, secreted by the different glands about the throat, which not only lubricates the food and assists its passage downwards, but also has a chemical effect. This effect will be illustrated if a piece of bread or biscuit is kept in the mouth for a little time, and although it may be almost tasteless at first, a sweetness will afterwards be observed, which is owing to the chemical effect of the saliva in converting the starch into sugar. That process is still carried on in the intestines, when the secretions from the pancreas or sweetbread mix with the food, rendering the starch comparatively soluble, and converting it into sugar, which can be more readily operated upon by the other organs. The chemical effect consists chiefly in displacing 4 per cent. of the carbon, sugar being weaker by 4 per cent. of carbon than starch. The vascular or true stomach is that in which the secretions really begin, the previous stomach being considered something like a mill for the preparation of the food itself, which enables the animal hastily to take quantities of undigested food, and afterwards convert it into nourishment. This true stomach may be considered to be presided over by the gastric juice, and just after entering the intestines there is another most important secretion which the food meets with, and that is the bile. If the bile should by any accident enter the stomach, it is very much like the entrance of a pug dog into a room generally occupied by a favourite cat; the cat

at once flies at the dog, and endeavours to drive him out; but it sometimes happens that there is a sharp struggle, and the dog gets the mastery; so sometimes the gastric juice will get the victory over the bile, or the bile may get the victory over the gastric juice—the one which is desirous of office tries to exclude the other, and thus those stomachs capable of vomiting are made to do so in consequence of the disturbance caused by the bile. It is said, "A place for everything, and everything in its place;" the place for the gastric juice is the stomach, and the place for the bile is the intestines. After being made soluble by the gastric juice, the food is then submitted to the operation of the bile. The gastric juice is of an acid character, and the bile is alkaline. It was formerly thought that the liver was solely for the purpose of secreting the bile, and that the use of this was to stimulate the intestines. It was held at that time that all the nourishment of the body was taken up in the form of chyle, a milky fluid, taken from the intestines, and conveyed to the arterial system; but it puzzled such physiologists to account for the manner in which an animal could be maintained by nourishment which passed along so small a vessel; and it has been latterly found that, instead of this conveying the greater part of the nourishment, it conveys the very least, and that the bile itself, although it has its chemical duties—although it may stimulate the intestines to proper action, yet its principal function is to separate the nourishment for the body, and re-convey it into the system, for it is found that seven-eighths of the bile is nourishment that enters into the body itself. Now the starch, the gum, and the sugar are the principles employed in providing the means of respiration, or rather for the support of the animal heat. The greater part of the food is employed in keeping the animal warm. We know that in the coldest climates, when the temperature may be considerably below freezing, the blood retains almost the same amount of heat, with a small exception, to what it possesses in tropical climates; therefore we cannot but suppose that in cold countries a considerable amount of food is required, not to increase the size of the animal, but actually to keep it warm and preserve its existence. Thus we find that in cold countries oil, which is rich in carbonaceous matters, and consequently contains the largest amount of fuel, is the favourite food; in some portions of Russia a native would exist on oilcake that our animals would reject. Oil in all its forms is very grateful to them, and we can readily account for this, as by taking a certain quantity of oil they double the amount of fuel that would be afforded by an equal quantity of starch, gum, and sugar, which differ only in a slight degree, all consisting of carbon, hydrogen, and oxygen, but no nitrogen. Flesh, on the contrary, contains in addition to the other elements nitrogen as well, and therefore it is the albuminous part of the food which is the most important; because, while it is important for such animals as exist for some length of time on flesh alone, for instance, carnivorous animals, it is impossible that starch, or sugar, or gum, or fat, or any of these elements of food which contain no nitrogen, can continue to preserve life for any length of time. It has been ascertained by physiologists that animals supplied with a great quantity of carbonaceous food alone pine away and die; and you will see that while these carbonaceous elements do not supply any of that material which makes up for the waste of the muscular system, the albuminous part does actually contain to a large extent that which will preserve the heat of the body as well. Thus flesh will support life because it supplies the waste of the tissues, and also preserves heat. If we take as examples various kinds of food, we shall find great difference in the albuminous properties of some as compared with others. Beans contain nearly one-fourth, or 24 per cent., of albuminous matter, whilst wheat contains only 12 per cent.; but this is sufficient for our system. Beans we could not endure, although they have about double the power of supplying the waste of the tissues as compared with wheat. Peas contain somewhere about 28 per cent.; barley about 13 per cent.; oats 13 per cent.; maize, or Indian corn, 11 per cent.; linseed cake about 26 per cent.; and rape cake rather more, about 29 per cent.; whilst linseed itself contains only 20 per cent. This will be readily understood, for in the process of making cake one-fourth of the linseed being oil is pressed out, and when this is taken away of course the proportion of the albuminous part must be considerably greater in that which is left. Locust beans contain only a very small percentage, not above 3 per cent., but about 50 per cent. of sugar, which accounts for their being so sweet. The albuminous matter resides in the bean

itself, and this is so extremely hard that it is almost impossible to be digested. [Mr. Spooner here handed round some specimens of the locust bean from Alexandria, and also samples of rape cake, poppy cake, cotton cake, and decorticated cotton cake, the peculiarities of which were explained. He afterwards proceeded:] A defect in ordinary cotton cake is that it contains a large proportion of husk, far more than in linseed cake, but as it is not valued and does no harm, this is not of much consequence. The decorticated cotton cake is part of a cargo that ran the American blockade. It is almost entirely freed from the skin, and thus it is called decorticated. The consequence is that this is chemically considered the richest and most nutritious cake that is known. It answers very well to prepare it so where such a large quantity of cotton is grown, because the husks are used as fuel to drive the engine which crushes the cake. It is about one-third dearer than the other cotton cake; but on reference to an analysis it will be found to contain a considerably greater quantity of nitrogenous matter—nearly 42 per cent. as compared with beans at 23 or 24 per cent., and linseed cake at 26 or 27 per cent. Then, on the other hand, it contains only moderately non-nitrogenous matter, although it abounds with a considerable quantity of oil. If we turn now to the other descriptions of natural foods grown on our farms, we find that in consequence of the very large amount of water that roots contain the proportion of albuminous matter is reduced in swedes down to less than 2 per cent. (1.8), swedes 1.5, and turnips 1.2; whilst the starch, gum, and sugar, including oil—that is, the carbonaceous matter—is 11 per cent. Thus you will see that the great distinction between roots and these concentrated foods is the great disproportion in the flesh-making property of the food in the one case, as compared with the carbonaceous matter, to what it is in the other. Whilst in beans the albuminous matter is about one-half what the starch, gum, sugar, and fat is, in mangold it contains only one-fifth, or rather one-sixth—the albuminous matter is only one-sixth as much as the carbonaceous matter. Thus it is that roots will support life far better than make fat. In many districts they are quite incapable of putting on fat, although they will preserve existence; in other districts they are more nutritive if given in sufficient quantities; but if we feed on roots alone, we must give three or four times the quantity of water that is necessary; therefore it is far better to give a less quantity of roots, and substitute other more nutritious dry food. Again in albuminous food we find that the starch, gum, and sugar in beans is 48 per cent.; in wheat it is 57, and thus wheat is 9 per cent. richer in starch than beans and peas or pulse; in barley 56 per cent., or almost equal to wheat: in oats, 46; maize, 64; locust beans, 50, consisting almost entirely of sugar; rape cake, 23; linseed, 20. And then we come to oil or fat, which is a most important property, for you will remember that it was stated just now that it contained double the quantity of carbon to what sugar contains, and nearly double to what starch contains, therefore we cannot be surprised at its being so readily converted into fat. There was an experiment related by Mr. Lawes some short time since, in which his object was to ascertain what quantity of food in different forms would produce so much flesh and fat, and he found that it took about four times the quantity of dry substance to make an equal quantity of food when he used dry chaff alone to what it did when he had succulent food, in addition to cake and corn; and he found the addition of barley to these had a greater effect than the addition of beans. But when he used linseed oil mixed with the beans, it was found to have a greater effect than either; and the oil that was used had a considerably greater effect than when double the quantity of beans were employed, showing that the animals pined after a certain quantity of nourishment in the form of oil, which thus relieved the system of extra exertion, for it was converted with little trouble into fat itself. We find then that oats contain about 5 per cent. of oil or fat; maize, 8 per cent.; rape cake, 11; linseed cake, 12; while linseed itself contains 34 per cent. of oil. Many persons imagine that it is better and cheaper to use corn in conjunction with linseed than to use linseed or other cake. That was no doubt true once, when there was no difference between the price of the seed itself and the cake made from it, because by using about one-third the quantity you supplied the animal with the same amount of oil as you did by three times as much cake; but when linseed oil is four times the price of the cake itself, the one being upwards of £40 a ton and the other about £10, you

will readily see how it is impossible, with the present competition in trade, that nourishment can be afforded in the form of linseed at anything like a proportionate equivalent rate. Thus linseed is about 50 per cent. dearer than cake; and the effect of oil being sold well is to bring down the price of cake. We have next on the list vegetable fibre, which in beans is 10 per cent.; peas, 10; wheat, 12; barley, 13; oats no less than 20; linseed cake, 14; linseed, 10; swedes nearly 4; and turnips somewhere more than 3 per cent. There has been some considerable doubt whether vegetable fibre must be considered as entirely devoid of nutriment or not. The term chemists give to vegetable fibre is *cellulose*. There had recently been experiments made, which some might have seen in the *Agricultural Gazette*, where a certain quantity of food was analysed and the quantity of vegetable fibre ascertained, and then the excrement was analysed likewise, and it has been found that there has not been anything near so much vegetable fibre in the excrement as in the food, plainly showing that a certain portion is taken up in the system. Many imagine this to be the case, and it points strikingly to the very great importance, if we intend to preserve any portion of straw or fodder, of cutting it in as young and green a state as possible, because when vegetable fibre is in a state of *cellulose* it is much more digestible, and contains a much greater quantity of digestible matter than after being exposed to the bleaching effect of sun and wind; and I think there can be no better system than cutting—oats particularly, the straw being almost always used for feeding purposes—as young as possible, because if a certain quantity of oats remain after thrashing, it only adds to the increased nutriment of the straw. We have thus glanced at the various constituents of food, and though there are a great number of other experiments calculated to show the amount of food required to produce a given effect, yet time will not permit reference to them, and we must content ourselves with a summary of the whole. It has been found that it takes something like 150 lbs. of turnips to make 1 lb. of mutton, if fed in the open air, but when housed in sheds under favourable conditions 100 lbs. have succeeded in making the same quantity of mutton; therefore 100 lbs. and 150 lbs. may be considered the extremes. I do not mean to say that in all cases 100 lbs. given in sheds will produce the same effect as 150 lbs. given out of doors, because sometimes those given out of doors will produce a better effect than the others; but it is well known that in a succession of four or five wet days the animals make little or no increase. This proportion of 150 lbs. of roots to 1 lb. of mutton is derived from a number of experiments made by different people, and is as near the fact as we can arrive. It is interesting, because it enables us to ascertain what is the value of a given quantity of roots, and what really is their feeding value; thus you may put what you like as the price of mutton, 6d., 7d., or 8d. per pound, and if it takes 150 lbs. of roots to make 1 lb. of mutton, it will require something like one ton or a little less to make 14 lbs. It has been found by accurate observers that the sheep will economise food better than the ox. Sheep, if fed on nutritious food, will make $\frac{1}{4}$ per cent. in live weight, whilst in the ox not more than 1 per cent. is made. In the pig a much greater amount of food is turned into flesh and fat; but then there is this drawback, that we are obliged to keep the pig on much more expensive diet, and it brings the result perhaps pretty nearly the same. In some other experiments it has been found that to make 100 lbs. of mutton, 170 lbs. of oilcake and 876 lbs. of swedes were used; in another, 321 lbs. of oilcake and 1,103 lbs. of swedes; and linseed was found not to present any more advantages than cake. In a trial between barley and beans it was found that 1 lb. of barley had as much effect on the animal as 1 lb. of beans; but then, as we have noticed, barley contains a considerably less quantity of nitrogen, a less quantity of nitrogenous matter; and although it proved sufficient for the animal, yet as nearly all the value of the manure resides in the albuminous matter, it shows at once that the value of that from beans, or cake, or other nitrogenous substances will be double that left behind by barley, oats, or even wheat. It is very important to bear this in mind, because if so much carbonaceous food can be bought at the same price as so much albuminous food, still it would be more economical to use the nitrogenous, because the manure would be more valuable, it being richer in ammonia, which gives the high value to guano and other manures for the corn crops. In these experiments it was sought to ascertain the quantity of food required by various kinds of sheep, but this might vary accord-

ing to the different circumstances to which they are subjected. It was found then that the Cotswolds required least, next the Leicesters, next a cross-bred, next to them were the Hampshire downs, and then the Sussex downs, which required the greater quantity of food. The Cotswolds required 802 lbs. of dry substance to make 100 lbs. of flesh, and the Sussex downs 877 lbs., but the last was the more valuable per pound. These experiments showed that it was very essential that animals should have a certain portion of food of various kinds, but inasmuch as roots consist so largely of carbonaceous matter and so little of nitrogenous matter, it is better to make up this by cake, unless grain can be got at much less expense. Whilst linseed cake produced a greater effect than peas or beans—that is to say 6 lbs. of cake produced something like the effect of 7 lbs. of beans or peas, yet the mixture of linseed cake and beans in the winter, or linseed cake and peas in the summer, produced a considerably greater effect on the feeding properties than either when one or the other was given separately. In conclusion, I have only to thank you for the patience with which you have listened to my somewhat desultory observations; but any omissions will doubtless be supplied by the practical remarks of the gentlemen who will follow, and thus we may be able to glean still further information on this important subject. (Applause.)

The CHAIRMAN alluded to the fact that there appeared to be very little difference between the feeding qualities of rape cake and linseed cake, though the animals did not like the first, and he asked whether the manufacturer could not find something to mix with it in order to make it more palatable, seeing that it was cheaper?

Mr. SPOONER said there was no doubt that the reason animals did not like rape cake was in consequence of its being extremely bitter. Its palatableness, however, increased by keeping. He thought it was best to introduce it to store cattle in the straw yard and to dairy cows, where it was not in the least injurious to the butter. As, however, it was manufactured for the sake of the oil, it would not do to mix anything with it then; but after it was crushed they might add meal to it, or improve its taste with the locust beans.

Mr. MARKE adduced an illustration of the advantages of giving his dairy stock rape cake in the straw yard.

Mr. T. H. SAUNDERS said he had never had so much hutter in his life as when he gave his cows rape cake. During the summer, however, he gave them some linseed cake, and when they calved next year and he tried them again with rape cake they would not touch it. He quite agreed that the best way to use it for fattening beasts was to mix it with any kind of meal they might be feeding upon, and he generally added a few grains so as to moisten it, by which means they could no doubt get animals to eat it. As to feeding sheep in the house and out of doors, a great deal depended upon the state the turnips were in, as those pulled long before using lost considerably in weight. In cold, wet weather sheep did best properly housed, but in favourable weather they did better out of doors. As to feeding, he thought that if they could buy beans at £9 a ton, and cake at £12 a ton, the beans were the cheapest; but if the prices were about equal he would prefer the cake. If they mixed meal and cake no doubt it was best. Should they think of feeding on rape cake they must put the beasts upon it before they had any linseed cake. He once tried sheep upon rape cake, but only a few began to eat it and others refused. A part of the flock no doubt ate too much, which scoured them, and he promised never to give them rape cake again.

Mr. SPOONER, in reference to the question of the advantages of using beans or cake, stated that in an experiment made by Mr. Tanner, of Birmingham, it was shown that it took 8 lbs. of beans to make as much meat as from 5 lbs. to 6 lbs. of cake; but when mixed they produced the best result.

Mr. READER gave an instance of the success with which he had used rape cake a few years ago for fattening beasts. It was of a brownish description, and he afterwards bought some of the best German green cake at a higher price, but the stock would not touch it. He agreed with Mr. Spooner that the difference was owing to the former having been kept longer, by which it lost much of its bitterness as well as its colour. He also found that sheep preferred stale linseed cake so long as it was not fusty. He was satisfied that if they could get rape cake palatable to the stock it was nearly as good as linseed cake. The great objection in giving it to

sheep was that while some refused others ate too much, which brought on the scour; but with beasts they could manage to give it to them separately, so that the one should not eat the other's food.

Mr. CHAPMAN SAUNDERS said he had been informed by every practical man that he had found old straw better for feeding purposes than new; he did not mean old straw thrashed out, but an old rick newly thrashed.

The CHAIRMAN, before the proceedings closed, was anxious to propose a vote of thanks to Mr. Spooner for his kindness in coming and giving them a lecture on this subject. It appeared to him that in considering the properties of feeding stuffs, a most important question to them was the price and the relative feeding qualities, because at the present time their own produce was selling at a very low rate. The best oil cake was something like £10 or £10 10s. a ton, and their best wheat something under 1d. a pound. Wheat at £10 a load would be a little lower per pound than oil cake. Other grain followed according to the price of wheat; and the question for agriculturists to consider was which was the cheapest and would answer best. They must recollect that in using their low-priced wheats, &c., which were at present a drag in the market, they would be keeping money in the country instead of sending net cash to the foreigner. In conclusion he proposed a vote of thanks to Mr. Spooner.

Mr. T. H. SAUNDERS begged to second the proposition, which was carried with acclamation.

Mr. SPOONER expressed his acknowledgments for the compliment that had been paid him. The first remark to which he had to reply was respecting the use of rape cake in the straw yard, instead of giving straw alone. There was everything to recommend it, and nothing that could be said against

it. If they gave straw alone the manure that came from the animals must be considerably worse than the straw itself, whilst if they added the cheapest form of cake, rape cake, the straw was not only converted into manure, but a portion of the nitrogenous parts of the cake also went to make it more valuable. As to the observations of Mr. Saunders, he observed that sheep did not suffer from cold so much as oxen, but they suffered more from wet. If any portable bedding could be devised to shelter them during the wet weather it would be a very great desideratum. With regard to old straw being best for feeding, he did not see why it should be worse, because the silica protected it, but why it should be better he could not say, unless time had some effect in rendering it more digestible. The chairman had called attention to the fact that English corn produce was selling at a low price, while cake, which may be considered principally a foreign production, maintained its price. Now if the price of wheat was low, there was something comfortable in the fact that they were the cause of it, they having grown so much that they could not expect to get a great price for it. But he thought it remained to be proved whether wheat at the present price was as cheap as cake; he believed not. That grain and the coarser kinds of wheat could be and would be used for feeding purposes he had no doubt; but then experiments had shown that a better result would be obtained by using linseed cake with them, and it could also be used profitably without. After a few other observations Mr. Spooner said this was a subject which ought to be every year taken up by farmers' clubs, for it was almost impossible to exhaust it: and there was that happy union of practice and science which was sure to interest the farmers as well as the public at large.

The formal proceedings of the evening then closed.

FARM BUILDINGS.

MECHANICAL FUNCTION OF BUILDINGS.

Farm buildings are mechanical structures; their special function, therefore, is a mechanical one. This is equally true of the farm-house in which the farmer resides, as of the cottage occupied by the herdsmen, the ploughman, or the shepherd, and of the cow-house and stable as of the barn, storehouse, and granary. Each may have its own special purpose to serve in the economy of the farm; but whatever that purpose may be, it is in character mechanical, and has, consequently, a kindred relation to that of the function performed by the cart, plough, or other implement. Buildings have a still nearer relation to roads, fences, and drains, each of which has its own mechanical function to perform.

These are fundamental data involving very important doctrines in farm practice. They clearly teach, in the first place, what is now generally admitted and acted upon by all intelligent agriculturists, viz., that farm-buildings should belong to the landowner. Like the drain, the fence, or the road, they have a function to perform that is inseparably connected with the land, and before such can be performed in the most economical manner, they (the farm-buildings) must occupy a certain position upon the farm. Shortsighted (we had almost said selfish) economists, who have got bits of land about the village, hamlet, or country town, may advocate, as we have often heard them do, "free trade in houses," as they vauntingly call it; but such advocacy simply amounts to this: That "the small lairds can beat the 'big-uns' in building houses;" ergo "small estates should supply large ones with household accommodation"! We have actually seen some of the small picaninny lairds so earnest in their advocacy of free trade as to get angry when their concocted and fallacious notions were laughed at as out of date. Their philosophy is no doubt, ironically speaking, *sterling* in one sense; for if they can cover a shapeless nook or corner of land with bricks and mortar, and screw out of poor people interest for their money invested, it is proof practical, in their estimation, that they are right; and, so long as the cottages thus erected are new, and so long as the large landowners do not supply their farms with the requisite amount of buildings which its mechanical requirements professionally demand, charity has

something to say in favour of the conclusion at which the small landowners thus prematurely arrive; but the moment both sides of the question are practically examined in detail, the out-of-the-way hole-and-corner system yelped "free trade in houses" is not only fallacious, but at the present time a curse to the country, as we shall show in our next paper under *The Pauper System and its "Rookeries"*; for the so-called free trade in the village practically means no trade at all upon the farm.

In the second place, houses being mechanical in their function, it is manifest that before they will pay the landowner for their erection, they must first be properly situated, and then successfully occupied. Experience, for example, in reference to the former, has given a universally concurrent assent to the general conclusion that wherever roads and subdivisions will admit, the homestead should be centrally situated. In the columns of the *Mark Lane Express* it would be superfluous to advance the practical details upon which this conclusion is founded, as its readers must be familiar with them. Now, exactly the same economical rule applies to the cottages of the labourers upon the farm, as to the residence of the farmer himself, or to the threshing-barn and the stable. The old cuckoo-song of any out-of-the-way nook or corner of land for a cottage is something worse than stale; for it stinks intolerably, in the teeth of half the amateur and philanthropic writers who are just now discussing agricultural cottage economy with flowing pens in the columns of the political journals. In point of fact there ought to be no out-of-the-way nooks and corners upon any farm, upon which to build cottages; for all fields should be squared off for economical husbandry; and, if this has hitherto been the rule under horse-culture, as unquestionably it has, it requires to be still more generally attended to, and carried out into practice, under steam-culture. It consequently follows that if the nooks and corners that abound in many places are covered with cottages and gardens, they will stand in the way of the straightening of fences, roads, rivers, &c., so as to effect a more economical subdivision of land on the rectangular principle practically adapted for economical steam cultivation. Those, therefore, who thus advocate building upon corners remind us of the story of the blind leading the blind; hence

the misfortune of landowners who are thus led astray by the above class of writers.

Generally speaking, the homestead, according to the above data, should be centrally situated, the farm-house and cottages being adjacent. In practice this is doubtless the exception as yet, the homestead being more frequently placed near some outside or corner than in compliance with the above rule. Again, with but few cases to the contrary, the farm house is adjacent to the steading, but the cottages are, on the contrary, more commonly at a distance. But in all these deviations from the rule, the loss of time, inconvenience, and other sacrifices are accordingly. We here speak from a long and successful experience in the management of servants, having always found the nearer the cottages were to the homestead the better, for two reasons; for in the first place the men were nearer to their work, being always within call; while, in the second place, their families required much less looking after than when at a distance, the children being more easily trained to habits of cleanliness, docility, general propriety of demeanour and respect to the authority of their parents and masters when they entered into service. Much depends upon the conduct of the parents and that of the farmer and his family, topics that will be discussed under subsequent heads, viz., The qualifications necessary to make the farm house and cottages pay interest on the capital invested in their erection; and Pauperism. Our present topic is, The position of the homestead and other buildings; and on this point the rule is manifestly as above.

The reduction of the rule to practice, however, is at the present time by no means a simple affair. This arises from the triumphs of steam in railway locomotion; in the cultivation of land; and in tramway and common road traffic; and from the alterations in the sub-division of land, to which such advances are fast giving rise. It is an easy matter for philanthropic writers to make hill and valley re-echo the blessings to be derived from new homesteads, farm-houses, and cottages in overflowing abundance; but not so easy a matter for landowners to comply with the progressive requirements at present demanded by the rapid progress of steam in its several bearings upon practical agriculture, and the resources of their estates generally. On the other hand, that is no valid reason why they should do nothing at all; for they may rely that if they remain inactive the steam horse will continue to go-a-head at the gallop, and soon leave them in the lurch, farther and farther behind than ever; or in the language of the old proverb, "Once in the rear always behind," or, "If you once let your horse (steam horse, of course) jump from under you, you won't get into the saddle again," (i. e. Scotch) "O'er the tail and eye a-hint."

With regard to the style of the farm-house and cottages more regard requires to be paid to durability and internal usefulness, or the functions they have to perform, than ornament. Generally speaking, sitting apartments and bedrooms are by far too small, while externally too much is sacrificed to appearance. In the former respect there should be no difference between the size of the bedrooms and sitting rooms of the large farm, the small holding, and the cottage. If anything the hard-working-man requires the largest sitting-room and bedroom because of the greater wear and tear upon his body, and quantity of refuse matter given off from his lungs and skin during the reparative process that takes place while in a comparative state of rest in his cottage. If the farmer is an active and energetic-minded man, his system, from the greater amount of anxiety and mental exercise experienced, may utilise more aliment, and give off a larger amount of refuse, respiratory and excretory matter, than the body of any labourer in his employment; so that, practically speaking, equality may be considered the rule as to the physiological requirements of the human body upon free space. In illustration of this, what, for example, can be more unworthy of the present age than the dimensions of the cottage for which a Prize of £25 is now offered in the *Journal of the Society of Arts*, at a cost of £100; a cottage in which the principal family bedroom is only 10 × 10 × 8! In this confined space with a floor of only 10 superficial feet, and 8 feet from the ceiling, we have to examine the physiological position of the hard-working man, his wife say with one child at her breast, and another in a crib or "shake-down" at the bedside, all ex-

haling profusely not only from the lungs, but every pore of the body. The free space for each is thus 5 × 5 × 8, or 200 cubic feet! In short, the bedroom is too small by more than one-half. It is even too small for the hard-working man himself were he unmarried, unless the door or window is left open over-night. Where the cottager's own bedroom adjoins, and is entered from the sitting room by means of a folding or sliding door, the plan economises both space and firing, as the door can be left open in the summer time after the bedroom window is shut at night; while in the winter season the open door leading into the sitting room keeps the bedroom comfortable, and thus renders a fire in it unnecessary in cold damp weather. The number of bedrooms in the prize cottage, viz., three, is also insufficient for the domestic and social requirements of a large family. But into details of this kind our present limits will not permit us to enter. Suffice it to say, in the meantime, on this head, that money spent in building such small cottages of this kind, as the above, is capital thrown away on the penny-wise and pound-foolish principle (if principle it can be called); and this applies equally to farm-houses. And more than this; for landowners should always bear in mind when building a new farm-house or a cottage, that it is not the style and requirements of to-day for which they are making provision, but for those of tomorrow, and therefore a large marginal allowance should be made at present for the progressive advancement and demands of steam-going times.

The style and dimensions of the homestead for the accommodation of cattle, &c., are of a kindred character with those of the farm-house and cottages. Thus farmers are evidently bent upon growing larger bullocks and more of them. Ditto ditto may be appended to the requirements of sheep pens and piggeries. Horses are rather getting out of fashion; but, on the other hand, the *steam horse* requires house-room. A more extended acquaintance with the physiology of our cattle is plainly teaching us that, like ourselves and labourers, they also require larger bedrooms before they can produce a healthy offspring, as a breeding stock, or a fine quality of meat for the shambles. In all these cases the book-rules and routine of the past are absolutely grown threadbare and wholly unsuited for the requirements of the future.

We now come to the solution of the all-engrossing question—*Will it pay?* To build suitable farmhouses, homesteads, and cottages, for the progressive requirements of the age, involves a large investment of landowner's capital. A very short excursion into any of the provinces must satisfy every intelligent practical agriculturist of the soundness of this conclusion. From time immemorial the old concurrent hypothesis has been a negative solution, so to speak, to our problem. Brick-and-mortar farming does not pay landowners. We once heard a shrewd, intelligent Scottish laird, who farmed largely and successfully himself, denounce the building trade as "worse than any of the Ten Plagues of Egypt;" and certainly their maxims, generally speaking, are not much in favour of the landlord's pocket, so as to make farm buildings pay interest. In this those who take advantage act a very short-sighted part, for their own interest is inseparably connected with that of their employers, so that both should pull together in designing and erecting farm buildings.

But however essentially necessary cheapness, ample accommodation and durability may be, the practical solution of the question Will farm buildings pay? is not a pecuniary one, as already stated, but a professional. To a good tenant suitable houses are an invaluable adjunct to the farm. With proper household accommodation for his cattle they will return more money for the produce they consume; good houses also economise the manual resources of the farm, and also reduce expenses in the stock department; and when these are added together, the sum will enable the farmer to give more rent than he otherwise situated could have done, and yet remain a very great gainer himself; and this difference of rent will be found remunerating interest on capital judiciously invested in the homestead. Of the soundness of this conclusion landowners and tenants are annually becoming more and more satisfied, generally speaking; and therefore the latter should qualify themselves accordingly.

That part of the general question Will cottages pay

requires a special notice at the present moment, when so much is being said on the subject of pauperism and cottage economy. In this case the practical solution is also a professional one. Honest, industrious labourers are well worthy of suitable household accommodation, rent free. They are the principal motive-power upon the farm, that which keeps all the rest of the machinery in active operation. And they are not only a species of working stock, but a "family" stock also; and therefore the faithful, trustworthy, and industrious cottager, who rears and trains up a rising family of labourers like himself, to supply his place when he is unable to perform his task, or (like the leaves in autumn, that fall from the tree after they have performed their function) to supply his place when he is carried from his task to the grave—such a man, we repeat, should rather receive an addition to his wages than be

mulcted of some £8 or £10 yearly as rent for his cottage and garden. Much is now being said about supporting paupers. This is certainly a subject *per se*, and therefore we shall return to it. Meantime we have only to observe that rearing healthy cottagers upon the farm is the very reverse of the village pauper system, for we have seen many active, healthy labourers, who supported themselves to within a week of their decease, and who left plenty, after supporting themselves on their deathbeds, to cover funeral expenses. But, on the contrary, bad and improvident characters will make the investment of capital in cottages a losing concern, and therefore such must be excluded. It is just like putting bad horses into a fine stable. The case is a clear one, and so is the course which landowners and their tenants should take—build good cottages, and only stock them rent-free with good cottagers.

THE BIRMINGHAM AND MIDLAND COUNTIES CATTLE AND POULTRY SHOW.

There are certainly few such pleasant gatherings as that annually called for Bingley Hall. With a thorough desire to advance, a cheerful courtesy for those with whom the business of the occasion brings them in contact, and the employment of a very efficient system, the direction of this society has long stood in favourable contrast with that of some others, where official priggishness and obstinate prejudice offer continual impediments to any further progress. It is pleasing to add that the more genial conduct of the Midlands Meeting has not been without its reward, while the step still further forward, as taken on this occasion, was signalized by undoubtedly the best show of cattle ever seen in Birmingham. There might not, perhaps, be any one so very extraordinary an animal, but each several section was well filled, and it was not until the visitor came to the sheep and pigs that his memory went back to any higher order of merit, as tried by the general strength of the entry. Then, if the roots have been as perfect in shape and condition, the new classes for corn were more than encouraging, and the poultry still better than ever. Of course, to accommodate these additional items in the catalogue more space has been found requisite, and a handsome gallery over the implement bay, and adjoining the poultry avenues, not only gives more room, but materially improves the appearance of the interior. Bingley Hall never yet looked so well, and was never so well furnished as for the Great Exhibition of 'sixty-three.

At nine o'clock almost to a minute, the one set of judges went to work over the cattle, and the other trio on the sheep. Of the four classes of Herefords with which the catalogue as usual opened, two were generally commended—the young steers and the heifers; although these were nicely balanced by the older animals of either sex, which were by no means either individually or numerically of much merit. The five Hereford cows, in fact, made up a very indifferent display, the best, Mr. Pitt's Cherry, a commended cow at Worcester, being somewhat flat-sided, and with nothing very striking about her, while Mr. Draper's second had some length; and the Royal third, though older than either of the others, was smarter and neater, but so wild and difficult to handle that the judges never had her out. At ten years old and after having had five calves, Mr. Baldwin's old Fairy has got rather beyond the high-water mark of the show-yard, and this was pretty generally the character of the class. The ranks of the Hereford oxen, again, were commanded by a great plain beast, exhibited by Mr. Phillips, and bred by Mr. Pitt, but with little beyond his mere size to recom-

mend him; Mr. Heath's next best was a fair useful animal, though a bad handler, and Lord Shrewsbury's third another one, with anything but the firm wealthy Hereford touch, or otherwise one of the best of the lot. A steer from the Royal herd was small and pretty forward, but mean behind; and another from Wantage, also as plain as a pike-staff to look on. The younger steers, however, were a capital company, amongst which Mr. Pitt's favorite, of which so much was expected, could get no higher than second, being a little too much on the leg; and fairly beaten by Mr. Shirley, with a very clever straight animal, full of good points, beginning with a fine blood-like head, and noticeable as the Bawcott Munalow beasts usually are, and as the highly commended one was also, for a famous coat. Mr. Williams' third prize, a mottle-face, also distinguishable for his good hair, was not so strong in hand, and with the further set-off, a bad weak back; while Mr. Draper had a very nice compact steer, and Mr. Stock another elevated from beyond the general compliment paid to the class. But it was not until the judges came to the heifers that they found the best of all the Herefords, and this was apparent the moment Mr. William Groves' entry was led out. It is seldom, indeed, that a grander animal to meet has ever been seen; with a beautiful bosom, a fine head and neck, deep, thick, and heavily fleshed, short on the leg, and fine in the bone, her touch was scarcely firm enough—a fact which might be accounted for from the heifer being evidently in milk. It was not stated in the catalogue that she ever had a calf, as this is immaterial, so long as the animals come within the prescribed age for heifers, though a discussion over the point was occasionally attempted. Mr. Bettridge's second was very level and pretty, if without the substance of her rival, but with a better answer to the hand—a recommendation that the third prize, again, was sadly deficient in. Indeed, whether from the long summer and no winter, or some other cause dependent on breeding or feeding, the Herefords failed chiefly in the matter of that firm, healthy and wealthy touch, for which they have been so long and so deservedly celebrated.

The first Shorthorn of his class, on the contrary, and the best ox or steer in the Hall, was a famous handler, a point that gave the finishing touch to his many other excellences. In colour a good roan, with a capital head, and very striking in his appearance when first led out, the Cotteamore beast is so handsome, level, and true, that his pride of place was settled long previous to the judges finishing the orthodox examination of the others entered against him. Still the second is a very good beast, of

more size, but not so perfect in his symmetry, having the fatal drawback of bad shoulders. Mr. Swinnerton's beast, however, is already famous in public, having won the All-England premium at Rugby on the previous Thursday; and, earlier in the year, all the honours at the Sparkenhoe Show, where we thus spoke of him:—"Mr. Swinnerton's ox is a very grand beast, uniting size and wealth with capital quality. He deservedly took not only the first prize as the best ox, but also the additional £20 in plate or money as the best of all the fat stock, oxen or cows; and he will no doubt be heard of again later in the year. He was bred by Mr. Stratton, of Broad Hinton, and is by Buckingham, out of Red Prim, the dam of the Christmas Gold Medal steer of some two or three years since." The Yorkshire white from Anlaby, that took the third premium, is very elegant, but rather wanting in substance, and bad behind the shoulder. Lord Aylesford and Sir W. de Capel Brooke were fairly commended her, but Mr. Holland sent a very bad sample from Dumbleton, and Mr. Druce's beast was not half fed. Mr. Baker came to the fore again with one of his own breeding amongst the steers, where he stood second with another good handler, deep and compact in his frame, and with rare quarters, but only middling forward; while, like his companion the Gold Medal ox, he came, as we heard, with all the home honours of the Oakham Show fresh upon him. Still a long way the best of this class was entered in a name not so familiar in the show-yard—that of the Reverend T. Stainforth, of Storrs, near Windermere, who sent a good steer of his own breeding; excellent in his quality, with a magnificent fore-hand, and good in fact behind and before: standing very square, this beast had only the set-off of being a little light in his thighs, or otherwise he was very perfect. The adjustment of the third place was not so readily bowed to, as were almost all the other decisions of the well-worked judges, many contending that Mr. Thompson should have beaten his noble employer, if not have taken second place. The Duke of Beaufort's beast, though neat and smart in his style, is very patchy already, as well as disfigured by a black nose; while Mr. Thompson's is better, both in quality and symmetry, with his shoulders wonderfully well covered, though he certainly looked light and harassed, as if the journey had upset him; but, under any circumstances, whenever they meet again, it will be a very near thing between master and man. Mr. Walter's commended beast was at best a coarse one, with his eye and coat bespeaking anything but a healthy condition; and Mr. Packe entered one of those wretched animals which even in these days still occasionally find their way into public. More than half the entry of Shorthorn cows received some notice from the judges, Mr. Lynn's first having been taking her tribute round the country during the last two or three months. With a sweet head, a kindly look, a fine line, good breadth, and small in the bone, this cow is still very loose and bad in her touch; the feeling being more like flabby blubber than good wholesome flesh; a manifest detriment that has told more against her before now. Lord Howe's second was as handsome as need be; and Mr. Baker, in much force, was third with a cow bred like the Gold Medal ox, by his late father, and with the two cardinal points, at least, of a nice head and good back. Still, again, the best of all the Shorthorns, as with the best of all the Herefords, was in the heifer class, where Mr. Charles Swaisland, a gentleman not much known to fame in this way, sent one very near perfection. Very grand in her frame and true in her symmetry, this heifer has fed wonderfully level, and it is rarely that any animal carrying so much flesh has had it so evenly laid on. She is, indeed, the very model of a *fat* beast, although in achieving this she has necessarily lost something of the female character that might have been developed

had she been kept for other purposes. Her back is extraordinary, and her touch excellent; but if we were prone to find fault, it would be with her withers, while her hoofs have been terribly neglected, though this is not observable until the animal is led out. However, these were mere trifles in comparison with her other manifest merits, and so the Kentish heifer was declared to be not only the best of her class, but the best of the Shorthorns; then the best of all the cows, and, of course, when it came to the deciding heat, the best animal in the yard, as she had already defeated the prize medal ox, when confined to their own ranks. The Shorthorns, consequently, carried all before them, winning the three grand premiums for the best ox, best cow, and best animal of all the show; neither of these, however, were eligible for Lord Chesterfield's prize for the best ox bred and fed by an exhibitor, which still went the same way, to Mr. Stainforth's Shorthorn steer. Mr. Swaisland, the owner of this now famous heifer, resides at Crayford, and was very successful at the Maidstone show last summer, where the stock was entered in the name of himself and his partner Mr. Stable, and when we thus wrote of them: "The heifers under two years old, the first exhibited by Swaisland and Stable, and the second by Mr. Betts, were both very good, and for breed and substance about the best pair of shorthorns in the show." Mr. Swaisland bought the chief lots at Sir John Lubbock's sale, and the Birmingham champion heifer was bred by Lady Lubbock. Mr. James' second was rather coarse, and not quite right in her back, but of great substance, and with a deal of good meat about her; and Mr. Stratton's, though by no means so forward, is sure to go on, having the strong essentials of "long, level, and handsome," with firm nice quality. The commendations which Messrs. Stubbs and Faulkner received were worth having in such company, as the Birmingham Shorthorns will take a deal of beating anywhere.

The entry of Devons was stronger than for many years past, with in the oxen and steer classes really something like competition. The majority of the entries were either from Devon or Somerset; but the extra twenty-five pounds for the best of all was claimed by General Hood on the part of her Majesty, for one bred by his late lamented Royal Highness the Prince Consort, in Windsor Park. And a very handsome specimen this steer is of the high-bred North Devon character, if lacking something of the use and substance of Mr. Farthing's best in the older lot; while the merits of the two will be tried again when they come, as they will, into the same class at Islington. The Royal Devon is by The Colonel; and Mr. Farthing's couple of young steers by his Peregrine; but the third best in the younger class is only a middling beast, and we doubt whether the Royal herd should not have taken two out of the three premiums here awarded. Mr. Tucker's, straight, lengthy, and level, was far away the best cow, despite the judges being some time in dispute over her merits as compared with those of a fine bred but patchy, and very gandy-quartered one entered by Mr. Smith, of Southerhay, and bred by Mr. Halse. Mr. Smith did better with his heifer; very smart and handsome, but small, and fit to rank with the Royal steer or Somerset beast for the first place in Mr. George Turner's affections.

Then, still in increased strength, there were more Longhorns than heretofore, with two or three fresh exhibitors in competition against those fast friends to the breed Messrs. Chapman and Burberry, who, however, ably held their own. Some of the crosses were capital, especially Messrs. Martin's ox, a very fine deep beast, and Mr. Pollok's heifer. The latter was, indeed, a picture to look at, but rather too small for a first; though round, true, and as full as an egg of good meat, all over her. She is wonderfully well bred, too, being by Booth's Prince of War-

laby out of a Galloway cow, a favourite cross with Mr. Pollok, with the produce taking all after the polled, and but little after the Durham—some evidence of the pure breeding of the Scots. These, when duly divided into horned and no-horned, made up two of the grandest sections in the show; the lot of West Highland oxen being far away the best filled class in the Hall, as never do we remember seeing them so numerous or so generally good. There were seventeen oxen entered, nearly all of which were sent; while the judges commended every one they saw, with five specially noticed beyond the two prize winners. The first of these, a red ox, exhibited by Mr. Sneed, is one of the truest animals ever exhibited; but at six years old he was considered to have been kept a little too long, and the extra prize for the best of all the Scotch-bred animals was awarded to Mr. M'Combie's polled Aberdeen, a beast of immense size, but no symmetry, and, on any scale of points, not to compare with the Highlander, which had to be content with Lord Dartmouth's extra premium as the best of his own breed. We confess to some regret at seeing him ordered out, when they were trying for the best of all the steers, as ineligible from having already been beaten by the big 'un, for the Highlanders are full of excellence, hardy doers, good diers, and the finest-flavoured beef ever put on a table. Mr. Pollok was second here again, curiously enough having sent three animals and taken a second with each of them. From the number of entries, both in the polled and Scotch horned ranks, it is clear that the awards of the last year or two have not been without their results, and it is no longer merely Mr. M'Combie nor Mr. Stewart that have their eyes on the Gold Medals and Champion Cups through such an agency as Scotch breeds or Scotch crosses. The three best represented breeds at Birmingham were the Shorthorns, the Highlanders, and the Scotch Polled. There were only two Welsh beasts sent, and for the Extra Class Mr. Lythall entered a pair of immense crossbred oxen that have been continually at yoke together in the plough field, the taller of the two being preferred by the Judges. In the companion class of extras Mr. Tennant again nominated Rosa, but she was declared ineligible, and the prize went to another immense animal, a white Shorthorn cow, very grand before, and 9 feet 6 inches in her girth. This was all very well as a curiosity, but it struck us the Judges were a little too prone to taping and measuring the beasts brought before them—not much of a proof, after all, to a man with his senses about him, an eye to see, and a hand to feel.

As already intimated, neither the sheep nor pig sections of the show were in anything like equal strength with the cattle classes. Of the former, in fact, never numerically in much force here, the entry evinced a decline as compared with that of last year; and over the two leading types of Leicester and Southdown there was the customary lack of competition. Mr. Poljambe once more had far away the best of the longwools, with a pen of fine quality and good firm flesh; and Lord Walsingham carried everything before him amongst the shortwools, with four lots of splendid sheep, still speaking to the improvements being carried out at Merton. They were generally well matched, and in the extra-prize pen, two out of the three were own brothers; while of the second-best, a couple were by the first prize Worcester ram. In accordance with a very proper principle as carried out in the management of Lord Walsingham's farm, all these fat sheep will be sold where they stand, and a fresh team be started for London, when the further success of the flock looks like a certainty. Notwithstanding that the Wests, Mr. King Tombs, and Mr. Kearsley were again exhibitors, the Cotswolds were wofully inferior to the imposing array of last Christmas; and the new class of

Oxfordshire Downs ran up to just three pens, with three or four ewes in the mixed class, where, however, Lord Walsingham's handsome model of a Down went clean away from her company, despite one of the late Duke of Richmond's breed being ranged alongside her. All these single ewe classes of Leicester, Other long-wools, Downs, and Shropshires resulted in good entries, and will, no doubt, be continued, although we doubt as to their really commanding much attention. The pens of Shropshires were certainly not so strong as they have been; and the first class of younger wethers was unmistakably inferior. There were many curiosities amongst them, such as black faces with white ears, and a noticeable want of established type with the different breeders. Lord Wenlock's two prize lots were, however, good fair sheep; and those of Messrs. Bowen and Jones wonderfully well trimmed; so that if there is to be a premium for cutting and curling, the Ensdon flock should be pretty sure of it. About the neatest sheep in the class were those of Mr. Henry Smith, from Sutton Maddock; but, if anything, they were too neat, and passed by accordingly, as lacking something of the true Shropshire character, which tends to a certain size and strongly marked features. Nevertheless, Mr. Foster's extra-prize pen were of much the same stamp, as we believe, of the same blood; and a very handsome pen they are, though the last their owner will ever show, as he is, or has, given up his flock. One of the three was very roughly handled during the day, under the impression that some of his wool had been glued on; but we were assured that this appearance was attributable only to the ravages of the maggot, and that any such tinkering or plastering had never been attempted. Mr. Holland's old sheep were a deal better than the young ones, as they need be, for the latter were a very wretched sample of what so influential a supporter of the sort should be able to show. Mr. John Overman was once more pre-eminent with his famous Leicester and Down cross, where Colonel Loyd Lindsay lost the second place for his Hampshire—and—Cotswolds, simply by going for too much. In one of his pens there was a single sheep of much merit, with a couple worthy of him in the other lot; and had the sorting of them been left to the judges, there is no question but that three out of the six would have been distinguished. But the gallant Colonel is by no means the first man who has made such a mistake, and, like the boy with the filberts, he has only to let a few through his fingers to land the remainder.

The swine are on the increase, as an entry of 98 *versus* 70 would prove; and Mr. Gangee had a trying day's work of it, when playing the dentist over every pig in the section, greatly to the dissatisfaction of the patients, however much or little their friends might approve of the examination. The one great class, either for numbers or merits, was that for single fat pigs, wherein the judges would have gladly given twice as many premiums as they had at their disposal. As it was, the winning colour ran upon white, and Messrs. Wainman, Stearn, and Mangles must have been more than content with that they did get. Any one of these three pigs was quite good enough for first, but with the actual winner from Carhead a very marvel of success in the way of breeding and feeding. The Royal Windsors and Mr. Cartwright of Aynho had the best of it amongst the other fat pigs, though with none of these quite up to the standard of the Birmingham pig shows; neither were the breeding pigs of average merit, the Berkshires being more especially below the mark—the acknowledged best pen, moreover, were disqualified, and this let in a new man, Mr. Allender, for first and second, with two certainly very clever lots, the ten all of one litter, with two more still left at home. Mr. Allender probably got his notion of a Berkshire at the Cirencester Collage, where he was a pupil, although certain entries of Berkshire pigs

from the same district are beginning to betray a strain of something a little finer than one looks for in the true breed—one of the most useful we have when conscientiously cultivated.

The poultry exhibition displays more than its usual excellence. The number of entries is very large, being 1,505 against 1,864 last year, with the specimens of the various feathered tribes remarkable for their uniform good quality and condition. This year new classes have been opened for black Hamburgs, Crève-Cœurs and Buenos Ayrean ducks. Both in the number and character of the Rouen ducks, the largest class in this division of the prize-list, a great increase is observable, alike in numerical strength and size, some single birds weighing nearly eight pounds each, and the heaviest pen coming within 2lbs. of the heaviest Aylesburys. As to the turkeys, the prize pens of three birds weighed respectively 65lbs, 61lbs., and 58lbs, while the geese are likewise exceedingly fine; one pen of three "mottled" birds weighing 77lbs., another 72lbs, another 70lbs, and another 63lbs.

Having already referred to the root show, where the potatoes were especially good, we may subjoin some of the prize weights:—First, silver cup, the entire weight of specimens, 393 lbs.; silver cup, class 2, entire weight of collection, 426½ lbs. Kohl rabi, first prize, 95 lbs.; second, 78 lbs.; long mangolds, first prize, 151 lbs.; second, 132 lbs.; globe mangolds, first prize, 183½ lbs.; second, 125 lbs.; swedes, first prize, 98 lbs.; second, 86½ lbs. The cabbages were alike commendable for their weight and growth; in first prize collection, one weighed 48 lbs., another 42½ lbs., and another 51 lbs.: total weight, 258½ lbs.

The implement bay was only in course of arrangement on the Saturday, but we found that, amongst others, the well-known firms of Ransomes, Garrett, Hornsby, Howard, Clayton and Shuttleworth, Ashby, Ball, Boby, and Robey, were to be represented during the week at Birmingham.

PRIZE LIST.

CATTLE.

JUDGES.—Mr. Richard Doig, Lillingston Hall, Buckingham. Mr. J. E. Jones, Springfield, Breinton, Hereford. Mr. George Turner, Beacon Downs, Exeter.

HEREFORDS.

OXEN OR STEERS.—First prize, £15, Mr. Joseph Phillips, Ardington, Wantage, Berkshire; second, £10, Mr. William Heath, Ludham Hall, Norwich; third, £5, the Earl of Shrewsbury and Talbot, Brancote. Commended: Mr. Joseph Phillips, Ardington.

STEERS.—First prize, £15, and silver medal as breeder, Mr. Richard Shirley, Bawcott Manalov, Church (Stretton, Shropshire); second, £10, Mr. George Pitt, Chadnor Court, Dleyn, Leominster; third, £5, Mr. John Williams, St. Mary's, Kingland, Leominster. Highly commended: Mr. Richard Shirley, Bawcott Manalov. Commended: Mr. Joseph S. Stock, Groveley, Northfield, near Birmingham; Mr. Joseph S. Draper, Thingehill Grange, Hereford. The class generally commended.

COWS.—First prize, £15, and silver medal as breeder, Mr. George Pitt, Chadnor Court; second, £10, Mr. Joseph S. Draper, Thingehill Grange, Hereford; third, £5, Major-General the Honourable A. N. Hood, Cumberland Lodge, Windsor.

HEIFERS.—First prize £15, extra prize of £25 for the best Hereford, and silver medal as breeder, Mr. William Groves, Walk Mills, Shrewsbury; second, £10, Mr. Henry Bettridge, East Hanney, Wantage, Berkshire; third, £5, Mr. John Williams, St. Mary's, Kingland. Highly commended: Mr. John Baldwin, Luddington, Stratford-upon-Avon. Commended: Lord Hatherton, Teddesley Park Farm, near Penkridge. The class generally commended.

SHORTHORNS.

OXEN OR STEERS.—First prize, £15, and Gold Medal as best ox or steer, Mr. William Henry Baker, Cottesmore, Oak-

ham. Second, £10, Mr. Robert Swinerton, Weddington Grove, near Nuneaton. Third, £5, Mr. John B. Thompson, Anaby, near Hull. Commended: The Earl of Aylesford, Packington Hall, near Coventry; Sir W. de Capell Brooke, Bart., Geddington Grange, Kettering.

STEERS.—First prize, £15, President's Silver Cup, value £25, for the best ox or steer of any age or breed, bred as well as fed by the exhibitor, and Silver Medal as breeder, the Rev. Thomas Stanforth, Storrs, Windermeres. Second, £10, Mr. William H. Baker, Cottesmore. Third, £5, His Grace the Duke of Beaufort, Badminton, Chippenham, Wiltshire. Highly commended: Mr. John Thompson, Badminton. Commended: Mr. John Walter, M.P., Bearwood, Berkshire.

COWS.—First prize, £15, extra prize of £15, given by the Earl of Aylesford, for the best Shorthorn, bred and fed by the exhibitor, and Silver Medal as breeder, Mr. John Lynn, Church Farm, Stratton, near Grantham. Second, £10, the Earl Howe, Gopsall Hall, near Atherstone. Third, £5, Mr. W. H. Baker, Cottesmore. Highly commended: The Earl of Radnor, Coleshill, Wiltshire. Commended: Mr. John Faulkner, Bretby Farm, Burton-upon-Trent; Mr. Joseph Noble Beasley, Brampton, near Northampton; Mr. C. H. Abbot, Long Ashton, Somersetshire.

HEIFERS.—First prize, £15, extra prize of £25, as the best Shorthorn; Gold Medal, as best cow or heifer in the Hall; and Innkeepers' Cup, value 25 guineas, for the best animal in the cattle classes, Mr. Charles Swaisland, Crayford, Kent. Second, £10, Mr. John James, jun., Coventry. Third, £5, Mr. Richard Stratton, Wall's Court, Stapleton, Bristol. Commended: Mr. Charles Stubbs, Preston Hill, Penkridge; Mr. John Faulkner, Bretby Farm, Burton-upon-Trent.

DEVONS.

OXEN OR STEERS.—First prize, £15, Mr. Walter Farthing, Stowey Court, Somersetshire. Second, £10, Mr. William Heath, Ludham Hall, Norwich. Third, £5, Mr. John Tucker, Staplegrove, Taunton. Commended: Mr. William Smith, Southernhay, Exeter.

STEERS.—First prize, £15, and the extra prize of £25, as the best Devon, Major-General the Hon. A. N. Hood, Cumberland Lodge, Windsor. Second, £10, Mr. W. Farthing, Stowey Court. Third, £5, Mr. W. Smith, Southernhay.

COWS.—First prize, £15, Mr. John Tucker, Staplegrove, Taunton. Second, £10, Mr. William Smith, Southernhay. Third, £5, Major-General A. N. Hood.

HEIFERS.—First prize, £15, Mr. W. Smith, Southernhay. Second, £10, Mr. John Tucker, Staplegrove, Taunton. Third, £5, Mr. Charles Hambro, Milton Abbey, Blandford, Dorsetshire.

LONGHORNS.

OXEN OR STEERS.—Prize, £5, and Silver Medal as breeder, Mr. R. H. Chapman, Upton, near Nuneaton.

COWS OR HEIFERS.—First prize, £10, and Silver Medal as breeder, Mr. Joseph H. Burbury, The Chase, Kenilworth. Second, £5, Mr. William Thomas Cox, Spondon Hall, Derbyshire. Commended: Mr. R. H. Chapman, Upton; Mr. Richard Hawkes, Hanscote, Charlscote, Warwickshire.

OTHER PURE BREEDS AND CROSS-BRED ANIMALS

(Except Scotch and Welsh).

OXEN OR STEERS.—First prize, £10, Messrs. J. and W. Martin, Aberdeen (Cross-bred); second, £5, Mr. Allan Pollok, Lismany, Ballinaloe, Ireland (Shorthorn and Galloway); commended, Mr. John Baldwin, Luddington, Warwickshire (Shorthorn and Hereford).

COWS.—First prize, £10, Mr. Charles Hobbs, Maisey Hampton, near Cricklade (Shorthorn and Cross); second, £5, Mr. Aaron Pike, Mitton, near Tewkesbury (Cross).

HEIFERS.—First prize, £10, Messrs. J. and W. Martin, Aberdeen (Cross); second, £5, Mr. Allan Pollok, Lismany (Shorthorn and Galloway); commended, Mr. John Faulkner, Bretby Farm, Burton-upon-Trent (Shorthorn and Galloway).

SCOTCH BREEDS.

POLLED OXEN OR STEERS.—First prize, £15, and extra prize of £25, for the best Scot, Mr. William M'Combie, Tillyfour, Aberdeen, N.B. (Aberdeenshire); second, £10, Mr. William Heath, Ludham Hall, Norfolk (Galloway). Highly commended, Mr. James Stewart, Aberdeen (Aberdeenshire). Commended, Messrs. J. and W. Martin, Aberdeen (Aberdeenshire). Class generally commended.

WEST HIGHLAND AND OTHER SCOTCH HORNED OXEN OR STEERS.—First prize, £15, and extra prize of £10, given by the Earl of Dartmouth, as best Highlander, Mr. Ralph Seedy, Keele Hall, Staffordshire (West Highland); second, £10, Mr. Allan Pollok, Lismany. Highly commended, Mr. Samuel Swan, Bush, Jedburgh, Roxburghshire (West Highland); Mr. Mordaunt Gordon Ransie, Eden Mouth, Kelso (West Highland); Mr. Harwell Ewin Bennett, Marston Trussell Hall, Rugby (West Highland). Commended, the Earl of Harewood, Harewood House, Yorkshire (West Highland, black); the Earl of Harewood (West Highland, dun). Class generally commended.

COWS OR HEIFERS.—Prize of £10, the Earl of Southesk, Kennard Castle, Forfarshire (polled Angus).

WELSH BREEDS.

OXEN OR STEERS.—First prize £10, Mr. Barwell Ewens Bennett, Marston Trussell Hall, Rugby; second £5, Mr. Henry Platt, Bryn-y-Neuadd, Bangor.

COWS OR HEIFERS.—[No Entry.]

EXTRA CLASSES.

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

Prize £5, Mr. Frederick Lythall, Spittal Farm, Banbury (cross-bred).

COWS OR HEIFERS.—Prize £5, Mr. William Lambe, Aurburn, near Lincoln (shorthorn). Highly commended: Mr. William Fletcher, Radmantwaite, Mansfield, Notts (shorthorn); Mr. C. W. Peake, M.P., Preatwolds Hall Farm, near Loughborough (shorthorn). Commended: The Lord Fitzhardinge, Berkeley Castle, Gloucestershire (shorthorn).

SHEEP.

JUDGES.—Mr. John Moon, Maristow, Plymouth.

Mr. John B. Spearing, Oxford.

Mr. Edward Gough, Gravel Hill, Shrewsbury.

LEICESTERS.

Three fat wethers, not exceeding twenty-two months old.—First prize, 15*l.*, extra prize of 10*l.*, given by the Mayor of Birmingham, for the best pen of long-woolled sheep, and silver medal as breeder, Mr. G. S. Foljams, Osberton Hall, Worksop, Nottinghamshire. Second, 10*l.*, Mr. Lawrence Willmore, The Newark, Leicester. Third, 5*l.*, Mr. Richard Lovell, Knapton, near Malton, Yorkshire.

LONG-WOOLLED, not being Leicesters.

Three fat wethers, not exceeding twenty-two months old.—First prize, 15*l.*, and silver medal to breeders, Messrs. Thomas and George West, Greenhill Farms, Bletchington, Oxfordshire (Cotswold). Second, 10*l.*, Mr. John Henry Elwes, Colesborne Park, near Cheltenham (Cotswold). Third, 5*l.*, Mr. Charles Kearney, Glestown, near Ross (Cotswold).

SOUTH AND OTHER DOWNS.

Three fat wethers, not exceeding twenty-two months old.—First prize, 15*l.*, and silver medal as breeder, The Lord Walsingham, Merton Hall, Thetford, Norfolk (Southdown). Second, 10*l.*, The Lord Walsingham (Southdown). Third, 5*l.*, The Earl of Radnor, Coleshill, Highworth.

Three fat wethers, exceeding twenty-two but not exceeding thirty-four months old.—First prize, 10*l.*, extra prize of 10*l.*, given by the High Sheriff of Warwickshire (C. M. Caldecott, Esq.), for the best pen of South or other Down sheep, and silver medal as breeder, The Lord Walsingham, Merton Hall (Southdown). Second, 5*l.*, The Lord Walsingham (Southdown). Highly commended: Mr. John Overman, Burnham Sutton, Burnham Market, Norfolk (Southdown).

SHORPSHIRE.

Three fat wethers, not exceeding twenty-two months old.—First prize, 15*l.*, and silver medal as breeder, The Lord Wenlock, Bourton Cottage, Much Wenlock. Second, 10*l.*, The Lord Wenlock. Third, 5*l.*, Mr. Charles Reynolds Kesling, Yew Tree Farm, near Penkridge, Staffordshire. Commended: Mr. Henry Smith, Sutton Maddock, Shiffnal.

Three fat wethers, exceeding twenty-two but not exceeding thirty-four months. First prize, 10*l.*, and Mr. Newdegate's silver cup, value 10*l.*, for the best pen of Shropshire sheep, and silver medal as breeder, Mr. W. O. Foster, M.P., Kinver Hall, near Stourbridge. Second, 5*l.*, Mr. Edward Holland, M.P., Dumbleton Hall, near Evesham. Commended: Mr. John Hanbury Bradburn, near Lichfield.

Single Shropshire Wether of any age.—Silver Cup, value £5 5*s.*, given by Messrs. Mapplebeck and Lowe; and Silver Medal, as breeder, Mr. W. O. Foster, M.P., Kinver Hill Farm, Stourbridge. Highly commended: Mr. John Coxon, Freeford, Lichfield. Commended: The Earl of Aylesford, Packington Hall, near Coventry.

OXFORDSHIRE DOWNS.

Three Fat Wethers, not exceeding twenty-two months old.—First prize of £10, and Silver Medal as breeder, His Grace the Duke of Marlborough, Blenheim Palace, Woodstock. Second, of £5, Mr. Samuel Druce, Eynsham, near Oxford.

CROSS-BRED SHEEP.

Three Fat Wethers, not exceeding twenty-two months old.—First prize £10, and Silver Medal as breeder, Mr. John Overman, Burnham Sutton, Burnham Market (Southdown and Leicester). Second of £5, Mr. William Hewer, Sevenhampton, Highworth.

LEICESTER EWES.

Fat Ewes of any age, having bred one or more Lambs.—First prize of £5, Mr. John Lynn, Church Farm, Stroxtou, Grantham. Second of £3, Mr. J. G. Watkins, Woodfield, Ambersley, Worcesterhire. Highly commended: Mr. J. G. Watkins, Woodfield.

LONG-WOOLLED EWES, NOT BEING LEICESTERS.

Fat Ewes of any age, having bred one or more Lambs.—First prize of £5, and Silver Medal as breeder, Mr. John Lynn, Church Farm, Stroxtou, Grantham (Lincoln and Leicester). Second of £3, Mr. Thomas Porter, Baunton, Cirencester (Cotswold). Highly commended Mr. Thomas Baunton, (Cotswold); and Mr. William Smith, Bibury, Fairford, Gloucestershire (Cotswold). Commended: Mr. William Smith, Bibury (Cotswold), for two entries; and Mr. Thomas Porter, Baunton, Cirencester (Cotswold).

SOUTH AND OTHER DOWN EWES.

Fat Ewes of any age, having bred one or more Lambs.—First prize of £5, and Silver Medal as breeder, The Lord Walsingham, Merton Hall (Southdown). Second of £3, His Grace the Duke of Marlborough, Blenheim Palace, Woodstock (Oxfordshire Down).

SHROPSHIRE EWES.

Fat Ewes of any age, having bred one or more Lambs.—First prize of £5, and Silver Medal as breeder, Mr. W. O. Foster, M.P., Kinver Hill Farm, Stourbridge. Second of £3, Mr. Henry Smith, Sutton Maddock, Shiffnal. Highly commended: The Lord Wenlock. Commended: Mr. C. R. Keeling, Yew Tree Farm, Penkridge, Staffordshire; Mr. John Hanbury Bradburn, Pipe Place, near Lichfield; Messrs. Bowen and Jones, Eusdon House, Shrewsbury (two entries).

P I G S.

JUDGES.—Mr. John Moon, Maristow, Plymouth.

Mr. John B. Spearing, Oxford.

Mr. Edward Gough, Gravel Hill, Shrewsbury.

Three Fat Pigs, of one litter, not exceeding ten months old: First prize £10, and Society's Silver Cup, value £5 5*s.*, and Silver Medal as breeder, Mr. Thomas L. M. Cartwright, Aynho, Banbury, and Melville House, Fife. Second, £5, Major-General the Hon. A. N. Hood, Cumberland Lodge, Windsor. Third, £3, Mr. Mark Sharman, Wellingborough. Disqualified: Mr. John Perrie, Hockley Hill, Birmingham.

Three Fat Pigs of One Litter, not exceeding fifteen months old: First prize £10, and Silver Medal as breeder, Major-General the Hon. A. N. Hood, Cumberland Lodge. Second, £5, Mr. George B. Morland, Abingdon, Berkshire. Third, £3, the Hon. Colonel E. G. D. Pennon, M.P., Penrhyn Castle, Bangor. Highly commended, Mr. John Darling, Beaudesert Farm, Rugeley. Commended, the Countess of Chesterfield, Bratby Hall, Burton-upon-Trent; and Mr. Thos. Crisp, Bentley Abbey, Wickham Market, Suffolk.

Fat Pigs, exceeding fifteen months old: First prize, £6, and Silver Medal as breeder, Mr. William Bradley Wainman, Carhead, near Cross Hills, Yorkshire (Carhead large breed). Second, £3, Mr. Samuel Gaeter Stearn, Brandeston, Wickham Market, Suffolk. Third, £2, Mr. George Manglas, Givendale, Ripon, Yorkshire. Highly commended, Mr. William Yells, jun., Round Robin Farm, Highworth, Wiltshire. Commended, Mr. John Darling, Beaudesert Farm'

Rageley; Mr. Thomas Crisp, Butley Abbey, Suffolk; Mr. W. B. Wainman, Carhead (Carhead middle breed); Mr. John K. Tombs, Langford, Lechlade, Gloucestershire (Berkshire).

BREEDING PIGS.

PIGS OF THE BERKSHIRE BREED.—Five of one litter, exceeding 3 and not exceeding 6 months old. First prize, £10, silver medal as breeder, and the Society's silver cup, value 5 guineas, Mr. George Mander Allender, Le Grange, Winslow, Bucks. Second, £5, Mr. George Mander Allender, Le Grange. Third, £3, Mr. Walter J. B. Scott, Queen's Hotel, Birmingham. Silver Medal, Mr. Wm. James Sadler, Beatham Calcutt, Cricklade. Highly commended, the Rev. Edward Roberts, Harborne, near Birmingham. Disqualified, Mr. Daniel Long, Whaddon, near Gloucester; Mr. John K. Tombs, Langford, Lechlade, Gloucestershire.

PIGS OF OTHER LARGE BREEDS.—Five of one litter, exceeding 3 and not exceeding 6 months old. First prize, £10, and silver medal as breeder, Mr. W. B. Wainman, Carhead (Carhead). Second, £5, Mr. W. B. Wainman, Carhead (Carhead). Third, £3, Mr. Frederick F. Wells, Weston-under-Wetherley, near Leamington. Silver medal, Mr. Andrew Guy, Eaton, Leicestershire (large white).

PIGS OF A SMALL BREED.—Five of one litter, exceeding 3 and not exceeding 6 months old. First prize, £10, silver medal as breeder, and the Society's cup, value 5 gu., Mr. Thomas Crisp, Butley Abbey, Wickham Market, Suffolk. Second, £5, Major-General the Hon. A. N. Hood, Cumberland Lodge. Third, £3, Mr. Robert Berkeley, Spatchley Park, near Worcester. Silver medal, Mr. Samuel G. Stearn Braceston. Disqualified, Mr. John Lynn, Church Farm, Strutton.

CORN.

JUDGE.—Mr. J. Mathews, Edgbaston House, Birmingham.

WHITE WHEAT.—Samples of one bushel each.—First prize, £2 2s., Mr. Charles Kearsy, Gilewstone, Ross (Calavera). Second, £1 1s., Mr. Joseph H. Clark, Altwood House, Maidenhead, Berkshire (Chidham). Highly commended: Mr. Thomas Backland, Windsor (Chidham).

RED WHEAT.—Samples of one bushel each.—First prize, £2 2s., Mr. Robert Raybird, Hengrave, near Bury St. Edmunds, (Shirred's Bearded). Second, £1 1s., Mr. Edmund Lythall, Radford Hall, near Leamington (Nursery). Highly commended: Mr. George Wallington, Little Hull, near Wellesbourne, Warwickshire (Nursery); Messrs. James and Frederick Howard, Britannia Farms, Bedford (Hallett's).

BARLEY.—Samples of one bushel each.—First prize, £2 2s., Mr. Joseph H. Clark, Altwood House, Maidenhead (Golden Malon). Second prize, £1 1s., Samuel Druce, Eynsham, near Oxford (Old Chevalier). Highly commended: Mr. Robert Raybird, Hengrave (Brewers' Delight).

OATS.—Samples of one bushel each: First prize, £2 2s., Mr. Frederick Lythall, Spittal Farm, Banbury (white); second, £1 1s., Mr. Frederick Lythall, Spittal Farm (white).

BEANS.—Samples of one bushel each: First prize, £2 2s., Mr. Thomas Halford, Newbold, Shipston-on-Stour (French white) eyes; second, £1 1s., Mr. Frederick Lythall Spittal Farm (Spring).

PEAS.—Samples of one bushel each: First prize, £2 2s., Mr. Robert Raybird, Hengrave (Early Emperor); second, £1 1s., Mr. Edmund Lythall, Radford Hall (Blue Field). Highly commended, the Lord Boston, Hedor, Maidenhead (maple or partridge).

ROOTS.

JUDGE.—Mr. J. Mathews, Edgbaston House, Birmingham.

A silver cup, or other article of plate, of the value of ten guineas, is offered by Messrs. Proctor and Ryland, of Birmingham, as a prize for the best collection of the four following varieties, namely: Long mangold-wurzel, globe mangold-wurzel, swedes, and carrots—six roots of each to be shown for this prize alone. Mr. John Moore, Warwick.

A silver cup, or other article of plate, of the value of ten guineas, is offered by Messrs. Griffin, Morris, and Griffin, of Wolverhampton, for the best collection of long mangold-wurzel, globe mangold-wurzel, swedes, and ox cabbage—six roots of each kind to be shown for this prize alone; the mangold-wurzel to be selected from crops of not less than two acres, the swedes not less than five acres, and the cabbage to be field-culture. The Rev. Thomas Stevens, Bradfield, Reading, Berkshire.

KOHL RABI (Six specimens).—First prize, £2 2s., Colonel North, M.P., Wroxton Abbey, near Banbury (green); second, £1 1s., Rev. Thomas Stevens, Bradfield. Highly commended, Col. North, M.P. (green.)

LONG MANGOLD-WURZEL (Six specimens).—First prize, £2 2s., Mr. John K. Fowler, Prefendal Farm, Aylesbury (Sutton's yellow); second, £1 1s., Rev. Thomas Stevens, Bradfield (red); commended, The Lord Boston (yellow), The Rev. Thomas Stevens, Bradfield.

GLOBE MANGOLD-WURZEL, Six Specimens.—First prize, £2 2s., Rev. Thomas Stevens, Bradfield. Second, £1 1s., the Lord Boston (yellow). Highly commended, Col. North, M.P. (Wroxton Improved); Mr. John Moore, Warwick; and Rev. Thomas Stevens, Bradfield. Commended, his Grace the Duke of Portland, Clipstone Park Farm, Notts (yellow, two entries).

SWEDES OF ANY VARIETY, Six Specimens.—First prize, £2 2s., Mr. John Darling, Beaudesert, Rageley, Staffordshire (Dickson's Bronze Top). Second, £1 1s., Mr. Samuel Robinson, Shaw House, Melbourne, Derbyshire. Highly commended, Mr. William K. Malins, Brackley, Northamptonshire (Shirving's); Mr. William T. Crobie, Ardert Abbey, Tralee (Sutton's Champion); Mr. Samuel Robinson, Shaw House; Mr. William Fletcher, Radmantwaite, Notts, (Sutton's Champion). Commended, Mr. W. T. Crobie.

COMMON TURNIPS, six specimens.—First prize, £2 2s., Sir William Heathcote, Bart., M.P. (Grey Stone); second, £1 1s., Mr. Charles Kearsy, Gilewstone (Grey Stone). Highly commended, His Grace the Duke of Portland (Green Globe), two entries. Commended, Rev. Thomas Stevens, Bradfield (Green top, white).

CARROTS OF ANY VARIETY, six specimens.—First prize, £2 2s., His Grace the Duke of Portland (Altringham); second, £1 1s., His Grace the Duke of Portland (Altringham). Commended, Mr. G. S. Foljambe, Osberton Hall, Notts (Altringham); his Grace the Duke of Portland (Belgian), two entries.

OX CABBAGE, six specimens.—First prize, £2 2s., Mr. Samuel Robinson, Shaw House (Robinson's Champion); second, £1 1s., Mr. Samuel Robinson, Shaw House (Robinson's Champion).

KIDNEY POTATOES, twelve specimens.—First prize £2 2s., Mr. George Mangles, Givendale, Yorkshire; second, £1 1s., Mr. Samuel Robinson, Shaw House (King of Flakes). Commended: Mr. J. Choyce, jun., Harris Bridge, Atherstone (New Seedling); Mr. Samuel Robinson, Shaw House (Malbourne Hero); Mr. John Shackel, Bleubheim House, Small Heath, near Birmingham (King's).

ROUND POTATOES, twelve specimens.—First prize £2 2s., Mr. G. S. Foljambe, Malvern (Wonder); second, £1 1s., Rev. Thomas Stevens, Bradfield (Red Rover). Highly commended: Mr. J. K. Fowler, Aylesbury; Mr. G. S. Foljambe (Dunbar Regent). Commended: Messrs. J. and F. Howard, Britannia Farms, Bedford (Regents).

REFEREE FOR THE AGES OF STOCK.—Professor John Gamgee, New Veterinary College, Edinburgh.

VETERINARY INSPECTOR.—Mr. E. Stanley, Stephenson-place, Birmingham.

SPARKENHOE FARMERS' CLUB.—The first meeting of the newly-appointed Committee of this Club was held at Ashby-de-la-Zouch. The election of patron, patroness, and officers took place. The Right Hon. Earl Howe has consented to be the President of the Society, and Lady Edith Abney Hastings has intimated her desire to become Lady Patroness. Mr. John Spencer, of Odstone, was elected Chairman of the Committee, and Mr. German (Lady Edith Hastings' agent) was elected Vice-chairman. The exhibition days were fixed for the 6th and 7th September. Lady Edith Hastings has kindly placed Willesey Park at the service of the Club. After the business was concluded, about twenty-four gentlemen sat down to dinner, Mr. German presiding, and Mr. Swinnerton occupying the vice-chair. After the usual loyal toasts had been disposed of, the healths of the President, Earl Howe, and the Lady Patroness, Lady Edith Hastings, were most heartily proposed and received.

RUTLAND AGRICULTURAL SOCIETY.

The annual show of this society took place at Oakham, on Thursday, November 26. The attendance of farmers was good, and the show itself superior in many respects to former displays of the sort. This society extends the privileges which it is calculated to afford to every parish which is situated within twenty miles in a direct line from the town of Oakham.

THE JUDGES.

Stock.—Mr. E. Lythall, Radford Hall; Mr. R. G. T. Howard, Temple Bruer; Mr. W. Torr, Ayleaby Manor.

Hunting Horses.—The Hon. G. J. Noel, M.P., Mr. R. Lucas, Edithweston; Mr. S. Hunt, Ketton.

AWARD OF PREMIUMS.

CATTLE.

For the best ox or steer, of any breed or weight, under five years of age, £16, Mr. W. H. Baker, of Cottesmore; 2nd, £7, Earl Spencer, of Althorp.

For the best ox or steer, of any breed or weight, under four years of age, fed within the district, £10, Mr. C. Chapman, of Exton; 2nd, £5, the Marquis of Exeter; commended, Sir W. D. Capell Brooke, Bart., of Geddington Grange.

For the best cow or heifer, of any breed, age, or weight, £10, and Uppenham School Cup, value £15, Mr. J. Lynn, of Church farm, Stroxtun; 2nd, £5, Mr. W. H. Baker, Cottesmore.

For the best steer under three years of age, £7, Mr. W. H. Baker, Cottesmore; 2nd, £3, Mr. E. Wortley, Ridlington.

For the best steer under two years of age, £5, Mr. W. H. Baker, Cottesmore; 2nd, £3, Mr. H. J. Rudkin, Langham.

For the best heifer, above two and under three years old, £8, Mr. W. H. Baker, Cottesmore; 2nd, £3, Mr. T. Chapman, Whitwell.

For the best heifer under two years old, £4, Mr. J. Lynn, Church farm, Stroxtun; 2nd, £2, Mr. R. L. Swingler, Ketton.

For the best cow, in-milk or in-calf, £5, Mr. J. Lynn, Church farm, Stroxtun; 2nd, £2, Mr. H. J. Rudkin, Langham.

For the best bull, above one and under two years old, £10, Mr. T. Chapman, Whitwell.

For the best bull, above two and under four years old, £10, Mr. J. Brothwell, of Braceby. Mr. C. Bays, of Kettering, commended.

For the best cow in-milk, £5, Mr. W. Hubbard, of Langham; 2nd, £2, Mr. G. Chester, of Waltham.

For the best heifer, under three years old, £4, Mr. C. Speed, of Exton; 2nd, £3, Mr. G. Chester, of Waltham.

For the best heifer calf, £2, Mr. J. Edgson, of Langham; 2nd, £1, Mr. G. Chester, of Waltham.

For the best breeding beast, shown as extra stock, a silver medal, Mr. J. Lynn, of Church farm, Stroxtun.

For the best fat beast, shown as extra stock, £5, Mr. T. Pulver, of Broughton.

SHEEP.

For the best three long-woolled fat wether sheep, a silver cup, the Right Hon. Lord Berners, of Keythorpe Hall; 2nd, £7, the Hon. Colonel Lowther, of Barleythorpe; 3rd, £4, the Right Hon. the Earl of Gainsborough, of Exton Park.

For the best three short-woolled or long and short-woolled cross-bred fat wether sheep, a silver cup, or money value £10, Mr. T. Horley, jun., of the Foase, near Leamington; 2nd, £4, the Most Noble the Marquis of Exeter, of Burghley Park.

For the best four long-woolled breeding ewes, £5, the Hon. Colonel Lowther, of Barleythorpe; 2nd, £3, Mr. C. J. Bradshaw, of Alstoe House, Burley-on-the-Hill.

For the best four long-woolled ewes, £5, the Hon. Col. Lowther, M.P., of Barleythorpe; 2nd, £3, Mr. W. Shipman, Eaton Lodge, Belvoir.

For the best four long-woolled wether lambs, £3, the Hon. Colonel Lowther, M.P., of Barleythorpe; 2nd, £2, Mr. J. Bradshaw, of Alstoe House, Burley-on-the-Hill.

For the best four long-woolled ewe lambs, £3, the Hon. Colonel Lowther, M.P., of Barleythorpe; 2nd, £2, Mr. C. Chapman, of Exton.

For the best sheep shown as extra stock, a silver medal, Mr. C. J. Bradshaw, of Alstoe House, Burley-on-the-Hill, Mr. J. Lynn, of Church Farm, Stroxtun, highly commended.

PIGS.

For the best fat pig, under 18 months old, £4, Mr. W. Carver, of Ingarsby; 2nd, £2, Mr. T. Suter, of Brook.

For the best fat pig of any small breed, under 12 months old at the time of showing, £4, Mr. J. Sleath, of Braunston; 2nd, £3, Mr. W. Carver, of Ingarsby.

For the best fat pig of any weight, £2, Mr. W. Bryan, of Ridlington; 2nd, £1, Mr. T. Hammond, of Eggleton. Mr. T. Clark, of Burley-on-the-Hill, highly commended.

For the best in-pigged or sucking sow or gilt, £3, Mr. J. Sleath, of Braunston. Mr. R. Healey, of Hambleton, highly commended.

HORSES.

For the best mare that shall be a good and quiet worker, for the general purposes of agriculture, £3, to Mr. S. Richards, of Glendon Lodge, Kettering.

For the best yearling gelding or filly for the general purposes of agriculture, £3, to Mr. R. L. Bradshaw, of Tinwell.

For the best half-bred four-year-old hunting mare or gelding, in riding order, bred within the district, £10 (given by the Marquis of Exeter), to Mr. W. Coleman, jun., of Long Clawson; 2nd, cup, or £7 (given by J. C. W. Ewart, Esq., of Loddington), to Mr. H. Hunt, of Caldecott; 3rd, £5, to Mr. J. M. Wilders, of Croxton.

For the best hackney mare or gelding, under seven years old, in riding order, not exceeding fifteen hands high, £5, to Mr. W. Hardy, of Thistleton. Mr. W. Laxton, of Morcott, commended.

TAUNTON AGRICULTURAL SOCIETY.

This society held its annual exhibition of stock in the cattle market on Friday, November 27. The show was small in most departments of stock, but for quality the animals surpassed all previous exhibitions. The weather was fine, and the show-yard was thronged with visitors. The Judges were Messrs. W. Comer, of King's Brompton; T. Cook, Craze Lowman, Tiverton; and W. Taylor, Hambridge. The following is the list of awards:

BREEDING STOCK.

Best bull above two years, pure breed, a handsome silver cup (offered by Sir P. P. F. P. Aoland, Bart.), Mr. R. Farthing, North Petherton; 2nd, Mr. J. Hole, Dunster. Commended, Mr. J. Milton, Park, Wiveliscombe.

Best bull, pure bred, not exceeding two years, a handsome silver cup (offered by Mr. James Hole), Mr. C. F. Perkins, Grange, Kingston; 2nd, £2 (offered by the Society), Mr. C. F. Perkins.

Best breeding cow, in-calf or calf by her side, £5, Mr. W. Farthing, Stowey-court, Bridgwater; 2nd, £2, Mr. J. A. Smith, Bradford Peverell, Dorchester. Highly commended, Mrs. Ann Kidnar, Fishleigh, Milverton; commended, Mr. T. Bond, Park, North Petherton.

Best heifer, in-calf or calf by her side, not exceeding the age of three years, £5, Mr. Cecil Smith, Lydeard House, Taunton; 2nd £5, Mr. Walter Farthing.

Best heifer, pure bred, not exceeding the age of two years, £4, Mr. C. F. Perkins; 2nd, £2, Mr. Cecil Smith. Highly commended, Mr. W. Farthing and Mr. Perkins. Commended, Mr. Cecil Smith.

Best breeding cow and offspring, a handsome silver cup (offered by Sir A. Hood, Bart., M.P.), Mr. John A. Smith; highly commended, Mr. C. F. Perkins.

Best bull calf, not exceeding twelve months old, £3, Mr. Wm. Gibbs, Bishop's Lydeard; 2nd, £1 10s., Mr. W. Farthing.

Best heifer calf, not exceeding twelve months old, £3 10s., Mr. W. Farthing; 2nd, £1 10s., Mr. C. F. Perkins.

HORSES.

Best thorough or half-bred colt, filly, or gelding, for riding or hunting purposes, £7 7s. (offered by the president), Mr.

C. Mumgrove, Charlton, Taunton; 2nd, £3 8s., Mr. Richard Clark, Bishop's Lydeard, Taunton.

Best cart mare and foal, a handsome piece of plate (offered by Mr. G. C. Bentinck, M.P.), Mr. J. Burston, Comer Wellington.

For the best cart gelding or filly under three years old, a handsome piece of plate (offered by Mr. Arthur Mills, M.P.), Mr. R. Veysay, Coxpit, Bridgewater.

FAT CATTLE.

Best ox or steer above three years, £6, Mr. John Tucker, Staplegrove, Taunton; 2nd, £3, Mr. H. H. Ball, Hunkridge, Taunton.

Best steer, under three years, £6, Mr. C. F. Perkins; 2nd, £3, Mr. J. Bult, Dodhill, Kingnton.

Best fat cow, £6, Mr. H. H. Ball.

Best fat heifer, £6, Mr. R. Farthing; 2nd, £3, Mr. W. Farthing. Highly commended, Mr. J. S. Butt, of Dodhill.

SHEEP.

Best pen of long-wooled breeding ewes, £4, Mr. W. L. Mullins; 2nd, £2, Mr. R. Farthing.

Best pen of short-wooled breeding ewes, £4, Mr. F. Rond, Whitelackington; 2nd, £2, Mr. F. Bond.

PIGS.

Best boar, £2, Mr. W. Osborne, Norton, Fitzwarren; 2nd, £1, Mr. W. Gupper, Duddleston.

Best breeding sow, £2, Mr. W. Gupper.

EXTRA STOCK.

£2 10s., Mr. C. Gibbs, Tatham, Bishop's Lydeard; £1 10s., Mr. Robert Farthing, North Petherton; £1, Mr. H. Ball.

RUGBY AND DUNCURCH AGRICULTURAL ASSOCIATION.

The annual meeting of this association took place on Thursday, November 26, at Rugby. There was a very good show of cattle and sheep. Mr. R. Swinnerton, of Weddington, took the society's first prize for the best fat steer, and the open prize of fifteen guineas for the best fat beast of any description, with the same animal. Mr. Caldecott also exhibited some good animals.

AWARD OF PRIZES.

JUDGES OF STOCK.—Mr. Bland, Dingley Hall, Market Harborough; Mr. John Tew, West Haddon; Mr. Powers, Baggington, Coventry.

CATTLE.

Fifteen Guineas, viz.: five guineas by Mr. Wm. Moor; four guineas by the Earl of Dalkeith; four guineas by Mr. C. M. Caldecott, and two guineas by Mr. W. Cropper, for the best fat beast of any description, Mr. R. Swinnerton, Weddington, Nuneston.

Best fat steer, £6, Mr. R. Swinnerton.

Best bull of pure breed, above a year old, £5, Mr. John Crofts, Lawford Hill.

Best pure short-horned bull, above one and under three years old, £5, Mr. S. C. Pilgrim.

Best cow, in milk at the time of the show, £5, Mr. W. Senhouse, Ashby St. Ledgers.

Best pure breeding cow, £6, Mr. Wm. Senhouse; second, £4, Mr. Thos. Caldecott.

Best heifer of pure breed, in-calf or in milk, under four years old, £5, Mr. Harry Brieley, King's Newnham.

Best heifer of pure breed, in-calf or in milk, under three years old, £5, Mr. Wm. Liggins, Cawton Grange.

Best yearling heifer of pure breed, £5, Mr. J. N. Norman, Harborough Magna.

Best pair of store steers, under three years old, £3 10s., Mr. Wm. Moxon, Grandborough.

HORSES.

Best cart mare, £5, Mr. S. C. Pilgrim, Burbage.

Best cart colt, or filly, £3, Mr. Thos. Fell, Hillmorton.

SHEEP AND LAMBS.

Three best fat shearings, of pure long wool breed, £3, Mr. Joseph Goodman, Drayton Grange.

Three best Shropshire shearings, £5, Mr. T. Horley, jun., The Fosse, Leamington.

Three best cross-bred shearings, £2, Mr. W. S. Townsend, Church Lawford.

Three best breeding ewes, £3, Mr. W. Cowley, Watford; second, £2, Mr. W. Winterton, Wolvey.

Three best theaves, £2, Mr. Thos. Bird, Belton.

Best pure-bred tup lamb, £3 10s., Rev. C. R. Bucknill.

Three best pure-bred wether lambs, £3 10s., Mr. W. Cowley, Watford.

Three best pure-bred ewe lambs, £2 10s., Mr. W. Cowley, Watford.

PIGS.

Best sow or yelt, of large breed, in-pig, or suckling its farrow of pigs under twelve weeks old, £3, Mr. Edmunds, Rugby.

Best sow or yelt, of small breed, in-pig, or suckling its farrow of pigs under twelve weeks old, £2, Mr. E. Umbers, Wappenbury.

Best boar pig, of any breed, £3, Mr. E. Umbers, Wappenbury.

EXTRA STOCK.

Best beast, as extra stock, which has been the property of the exhibitor six months preceding the show, £5, Mr. E. Bennett, Marston Hall, Theddingworth.

ABINGDON FAT CATTLE, CORN, AND ROOT SHOW, 1863.

PRIZES.

BEASTS.

£5 for the best Fat Ox—Mr. J. Phillips; £3 for the second best—Mr. W. Aldworth.

£5 for the best Fat Steer under 4 years of age—Mr. W. Aldworth; £3 for the second best—Mr. S. Druce.

£5 for the best Fat Cow—Mr. C. P. Dafield; £3 for the second best—Mr. J. Phillips.

£5 for the best Fat Heifer under 4 years of age—Mr. H. Betteridge; £3 for the second best—Mr. W. Aldworth.

£5 for the best Fat Heifer under 8 years of age—Mr. W. Aldworth; £3 for the second best—Col. L. Lindsay.

£3 for two best Heifers, in-calf, under 8 years of age, and £2 for the two second best—Mr. R. Craddock.

A silver cup, of the value of £5 5s., the gift of J. B. Jenkyns, Esq., for the best two Heifers shown in class 6—Mr. R. Craddock.

A silver cup, of the value of £5 5s., the gift of T. Parr, Esq., for the best Beast shown—Mr. Joseph Phillips.

A silver cup, of the value of £5 5s., the gift of J. T. Norris, Esq., M.P., to the exhibitor of the best Heifer in class 4—Mr. H. Betteridge.

A silver cup, of the value of £5 5s., the gift of R. Benyon, Esq., M.P., for the best Fat Steer under 8 years of age, and £3, given by the Society, for the second best ditto—Mr. H. Betteridge.

A silver cup, the gift of Lord Overstone, to the exhibitor of the best Heifer in class 5—Mr. W. Aldworth.

SHEEP.

£3 for the best pen of three fat half-bred Wether Sheep, under 22 months old—Mr. S. Druce; £2 for the second best—Col. L. Lindsay.

£3 for the best pen of three fat short-wooled Wether Sheep, under 22 months old—Col. L. Lindsay.

£3 for the best pen of three fat Ewes—Mr. Wm. Button; £2 for the second best—Mr. W. T. Wallis.

A silver cup, of the value of £5 5s., the gift of Mr. J. B. Jenkyns, for the best pen of five Tups, born after the 1st day of January, 1863, drawn from a flock of not less than 100, not more than one week before the Show; to be fed as the flock on the farm; to be shown untrimmed, and bred by the exhibitor; and second prize of £3, given by the Society—Mr. W. Button.

CALVES.

£3 for the best fat Calf, under 14 weeks old; and £1 for the second best—Mr. G. Stone.

PIGS.

£3 for the best pen of three fat Pigs, of one litter, under 9 months old; £2 for the best fat Pig under 14 months old, and £1 for the second best; and £3 for the best fat Hog, irrespective of weight, age, or breed—Mr. G. B. Mordant.

THE FUTURE PROSPECTS OF THE PLOUGH.

In this paper we have to examine the plough from a physiological point of view. However important the mechanical and chemical questions involved in our subject may be, it is the produce of harvest that determines their real value, and this is a plain question in physiology. We may talk a great deal about the construction of the plough, the shape of the furrow slice; but what care corn and cattle for either, or even for the best half of the chemistry now being taught farmers, as to the potency of this and the next kind of manure? And besides, if corn and cattle wont grow, it is a well-authenticated fact that weeds and vermin of infinite variety will flourish in all their normal exuberance! So that the fertility of the land is subject to a two-fold definition—corn or weeds, practically speaking. From time immemorial farmers have been familiar with this natural peculiarity. Hence the old saying: "Ploughing the farmer out of a crop," "Sit to thistles," "Twitch tillage," "Harrowing for charlock," and so on, *ad infinitum*. In short, there is a natural relation between the vegetable kingdom and land, that the cultivation of the latter develops.

Steam culture promises to be highly favourable to both corn and cattle in this respect. Wheat and all the cultivated crops require that deep rough sort of cultivation which is the peculiar characteristic of work done by the steam plough; because it supplies them with air and moisture in a manner conducive to their health; and for a similar reason it is inimical to the growth of twitch, thistles, and other weeds that luxuriate in the land when in the opposite condition, or in that of shallow culture, with a deficient supply of air, but an abundance of moisture. And with regard to live stock, it is also a well-authenticated fact, that where the cultivated crops do not thrive when the land is under them, cattle do not thrive on such land when it is under grass.

It is interesting to contemplate the relation which thus exists between land and its produce. And this is equally true of bad cultivation and its natural progeny, as of good management and its family. Thus, a field is being ploughed and sown with wheat, or barley, or oats, or beans, or turnips, &c. The land is in the best order, and everything going on successfully; but something calls off the good hands, so that the field is left to be finished, and is finished in a different style of workmanship, and the weeds just know as well as the farmer where the good hands left off and the bad ones began. Or, again, a field may be sown; but before the harrowing is finished the work is overtaken by a heavy storm of rain, and both the weeds and the corn tell to every passer-by the last stroke of the harrow when the thunder-cloud burst and deluged the land. An infinite number of examples of this kind might be quoted; but such is unnecessary, as every practical farmer of any lengthened experience must be familiar with them, and also with the long train of results that follow.

A very great deal has been said of temperature, light, air, moisture, and the geology of soils, as being mainly instrumental in determining the health of plants and their distribution upon the surface of the globe; but located as we are, comparatively speaking, upon a certain isolated spot, it would be well for us to talk more about the mechanical influences of cultivation, as the latter, under such circumstances, have as much, if not more to do, in determining the species of plants that will thrive the best, luxuriating in the highest degree of perfection under each peculiar quality of work. Between different geological qualities of soil, as clay and chalk, and the species of plants which they naturally produce, there is no doubt a corresponding difference; but between pure chalk and clay there is a wide mechanical difference; while, upon both descriptions of soil the influence of good and bad ploughing upon their produce is familiar to all who have any experience in their management, so that this is more in favour of the argument than against it.

Plants that grow on land naturally are therefore no safe rule for the growth of others, or even the same species of plants under artificial systems of management. Both examples are subject to the laws of nature. Upon this head there

can hardly be a question fairly raised. But the facts under consideration prove that nature has more laws than one, so that when one law does not apply another will. In other words, wheat, thistles, docks, couchgrass, charlock, &c., have each a law of their own, to which they respond when the wheel of fortune brings it round to their respective doors; and the plough has always hitherto had something special to do with the wheel of fortune, and, doubtless, will continue to have for the future.

The case is a clear one; and, as regards the future, the steam-plough is decidedly in favour of the cultivated crops, as already stated, and against weeds. It promises to be so under both the circumstances of the case, *i.e.*, good work and bad weather, for it will greatly, if not wholly obviate the necessity of working land in a bad season.

These are advantages in favour of the steam-plough that can hardly be over-estimated. Less seed, manure, and labour in seed-time, and more produce of a finer quality in harvest, is certainly a golden rule; and it is, in verity, the practical rule which is everywhere now being taught at both these interesting seasons, under steam-culture. We may call it a more artificial system of cultivation than horse-culture, and unquestionably so it is; but, although more artificial in its exterior appearance, it nevertheless proves itself to be at the same time also more natural, because better suited to the natural wants and health of wheat, barley, and the other cultivated plants of modern husbandry, including the grasses.

This is a practical question that requires to be thoroughly understood, because no little of the future prosperity of the agriculturist hinges upon its real value or soundness being appreciated. There is a proneness in fallen humanity to over-estimate the value of man's own handicraft, and to withhold from Nature what is her legitimate right; and from this untoward rule farmers are by no means wholly exempt. To a certain extent there may be a judicious propriety in estimating the work of a mechanic or ploughman at its maximum value; but the moment we begin to determine values by our own notions, and not by the laws of nature, as exemplified in the results they produce, that moment we are liable to fly off at a tangent from some point or other of the circle; and the greater the speed at which the wheel of progress is moving at the time, the greater is this tendency to leave the right line that alone leads to permanent success.

At present, when the steam-plough is entering our fields for the first time, the practical bearings of the question require to be openly discussed by farmers, and not, as is too commonly the case, to be left out as matters of detail that are understood. The reason of this is manifest, for half the leaders of the agricultural public just now, in reference to steam-culture, and indeed every branch of agriculture, are only amateurs, who do not see things in the same light as do practical men accustomed to watch with daily care and interest the health of their crops and cattle in the field. Thus, a practical farmer may attribute to the plough what really belongs to his ploughman as a matter of artistic merit, while he himself all the while has his eye upon the harvest field and the ninety-and-nine causes that produce the best crop; and such detail is equally well understood by his brother-farmer with whom he is conversing; but when we turn to the amateur, or mere theorist, it is otherwise, for then the "common sense" of the practical man—which is only understood by his brother-farmers, or those experimentally familiar with the operations of the field and health of the crops grown, and livestock reared—is to them a *dead language*; while in its stead a system of hyperphysical mythology is taught, that is perhaps less understood by themselves than by those whom they affect to instruct in the science and practice of agriculture! With the latter, Nature is nought, because her relation with the plough is not practically understood in the field, while persons are everything. This may not be exactly in accordance with their good intentions, or much of their superficial philosophy, which they teach; but when leaders thus get into the vortex of a sort of fashionable routine, like a mechanical automaton

dancing on stilts, this "person's opinion," and that "one's plough" being the only rules taught; the case assumes dangerous and even contagious symptoms that require to be carefully watched, if not treated as all other contagious diseases are by practical men.

The difference between good and bad work is not more than sufficiently well understood even amongst many practical farmers—men who have served an apprenticeship in the field, and who can hold the plough with some degree of professional credit to themselves. Much of this is doubtless owing to the objectionable routine hitherto taught relative to the peculiar mechanism of the plough, form of the furrow-slice, and angle at which it should be laid, coupled at the same time with the unmerited amount of ridicule which has been cast upon the maxims of practical men, as antiquated and unworthy of patronage, although based on the infallible laws of Nature. When the burlesque style of argument is adopted by landowners and pseudo-teachers, it is no easy matter for tenants to uphold the infallible dicta of experience against such odds, especially when they are not sufficiently versed in physiology to be able to defend themselves on scientific grounds. The blasting influence of this upon the healthy progress of sound practice may be more easily imagined than expressed in terms suitable to the occasion. Suffice it to say that it has greatly retarded the progress of physiological inquiry amongst the great body of the agricultural interest, including both landowners and tenants.

But the days are nearly expired when fashionable routine of this kind can be successfully taught the general agricultural public. In other words, the steam plough is effectually co-operating with other branches of science in raising a totally different superstructure. In the progress of things, events do not break forth singly. On the contrary, they fall upon the farmer like the drops of rain from a summer cloud; for with the mechanical question of the steam plough, others of no less importance have arisen simultaneously for solution,

relative to chemistry and physiology. Farming is no longer an isolated profession, subject to a negative rule; for it requires a larger amount of general knowledge than perhaps any other art to control its details successfully; and the physiological questions involved in the cultivation of land, are perhaps engaging a larger share of practical inquiry at the present time than any other.

Eventually the steam-plough will effect a more uniform quality of tillage work than is now being performed by the horse-plough. The difference between good and bad ploughing is great, and has long been felt as a millstone about the neck of the farmer, generally speaking; but it is now about to be removed, so that for the future, he will move with a much lighter and more elastic step in the march of progress than hitherto. Indeed, not a few already feel themselves relieved from a very heavy burden of weeds, with its counterpart "little corn and much tail," while an overflowing bushel affords unquestionable proof that the natural law, or normal relation that exists between the plough, the land, and the crop, is beginning to be practically understood and appreciated. The advantages that will thus be realized when steam-culture is fully matured and in general operation are manifold; for, on the one hand, the weeds not only consume the manure, and impoverish the land for the growth of corn, but also incur a heavy expense of labour to keep them under; while on the other, the crop is deficient both in quantity and quality of corn and straw. No doubt for a short time there will be a large amount of inferior work done by steam-ploughs and cultivators, and no little imposition practised upon the credulity of many, as to which is the best implement and system of cultivation. Experiences of this kind are the common lot that attends the introduction of almost every new thing, and a change so vast as that from horse to steam in the cultivation of land would be an exception without precedent. But obstacles of this kind will soon disappear before the telling returns of seed time and harvest.

THE MANAGEMENT OF AN ARABLE FARM.

At the Penrith Farmers' Club, the following interesting lecture and discussion took place lately.

Mr. MOFFATT said: The subject which I introduce to-day for our discussion is "The Management of an Arable Farm;" and, in doing so, I must confess that I do feel some reluctance in throwing the gauntlet, because I am quite sure that any gentleman that I see before me would do greater justice to the important subject than I can pretend to do; nevertheless, I shall endeavour to lay before you my own simple views how I consider an arable farm ought to be managed, and which, I trust, if carried out, will give a greater return to the tenant; and if I can by any means throw out a few practical hints to my brother-farmers I shall consider myself amply paid for the little trouble I have put myself to this afternoon. Allow me, before entering into the detail of this subject, to intimate to you the conversation I had with a tenant farmer some time since, who occupies a cold clay land farm, consisting of about 160 acres of land. I understand his rent is somewhere about £150 per annum. In walking over his farm, I saw the farmer and his men reaping wheat in a field near the homestead. I said, "You have an excellent crop of wheat here, and good grass seeds; also a very good crop of oats in the adjoining field." Both fields are close to the homestead. "Yes," he replied; "wheat is selling at such a bad price, now, that it will not pay the farmer to grow it." "Then why do you grow it?" I asked. His answer was that, "We cannot pay our rent on a cold farm like this if we do not grow wheat." I inquired how many horses he required to work his farm? He said: "Two pair; and sometimes an odd one in the spring of the year to assist him in putting in his crop." I then asked how many acres of land he generally ploughed out of lea in a year? "About twenty-five acres; but that depended rather on the size of his fields—sometimes more and sometimes less." My next question was, "Why do you plough those good fields close to your homestead? Do you not think they would graze well, and pay you better?" He said, "Perhaps they might;

but I am obliged to plough the good land to help to manage the bad." I then said, "I think you err in doing so. Now, according to your own showing, you require a pair of horses, carts, ploughs, harrows, trapping, and other implements to work about thirty-six acres of land." I then asked, "How much do you think that a pair of horses, man-servant, blacksmith's bills, saddles, &c., wear and tear, cost you every year to keep on your farm?" He answered, "I do not know; I never entered into these calculations." "Well," I replied, "I shall tell you what I think—that no farmer can keep a pair of horses, man-servant, &c., for less than £100 a-year." He shook his head, and said, "Well, I cannot see that." I told him to think about it. Before we parted, I suggested that if he would lay down to graze about sixty acres of his land near the homestead, and do away with a pair of horses, &c., he would find it a good saving, and pay time much better than ploughing it. With these few prefatory remarks, I shall now proceed with our subject. The first thing that I ask to be done is, that all landowners drain their land. It is the best investment they can make. They will receive at least five per cent. for their outlay. No security is required. The improvement is in the land. Secondly, that all tenants or occupiers thoroughly clean their land of all obnoxious weeds, and see that no thistles, &c., are allowed to run to seed in their hedgerows; and, thirdly, put on a sufficient quantity of manure—lime, or other artificial manure—which will produce an excellent crop of any kind during the various rotations. I now assume that a farm consists of 200 acres of land, chiefly arable. The first thing that I recommend, that a quarter at least of every arable farm in the county be converted into grass, properly laid down in a manner which I shall explain afterwards. I apprehend that you will find on most farms about ten or fifteen acres of meadow, that, deducted from the grass, will leave about 180 acres to go through a rotation of cropping. There will be twenty-six acres in oats, after lea, twenty-six in fallow or green crop, twenty-six in wheat or other grain, sown down with seeds,

twenty-six in seeds for hay or grass, and twenty-six in grass two years laid. This, I apprehend, will require two pair of horses, &c., to work the same. On all retentive clay soils, I recommend that the lea land for oats be ploughed soon after Christmas, provided the weather is suitable, because the land gets the advantage of the frost, and much more likely for a crop. On light soils, the month of March will do. I think a great mistake is made by many farmers in being too late in sowing their oats. On all dry soils, not later than the month of March. After sowing the lea oats, never harrow the land across the furrows; invariably harrow it the same way as ploughed. You will find, by so doing, the oats will ripen even, and, generally, you will get a better crop. The next rotation is fallow or green crop. I should like to see that there was scarcely any fallow on any farm in the two counties of Cumberland and Westmoreland. If all the land was thoroughly drained, the fallow might be dispensed with in a great measure, because, at the present price of wheat, it will not pay. Every practical farmer knows that the cost of putting in an acre of wheat on fallow ground, labour, taxes, and two years' rent, will cost nearly six pounds per acre; and if the produce is only about seven Carlisle bushels per acre, at the present price, I think we will all be agreed on this, should we not agree on any other, that it will not pay the grower. Some one, I think, will say that there is land (such as Sowerby pasture) that must be fallow—it will not grow green crop. I admit that there is some land in that district which I found a difficulty in suggesting any other course. Now, let us see how this fallow and green crop land is generally managed, according to the present style of farming. I recommend that the first ploughing out of oat stubble for green crop you plough deep, I shall say not less than seven or eight inches, and not later than the month of November, provided the weather will admit. The winter frosts assist much in the pulverizing of the soil. I recommend, for a green crop (either potatoes or turnips), ten or twelve cartloads of good farmyard dung, and two cwt. of best Peruvian guano; and, if you have not a sufficiency of farmyard dung to sow all your green crop land, then give two cwt. of guano and three cwt. of prepared or ground bones, which together will be a fair quantity to produce a good crop. I am an advocate for all farmers to grow as many swedes as he possibly can. He will find, at the long run, they are the most profitable crop he can grow, and consume as many as he can on the land with sheep. I do not recommend farmers to grow many potatoes, particularly on strong soils. I think they are the most impoverishing crop that a farmer grows; but, on light soils, they may be grown to profit. I now proceed with the fallow land. Many gentlemen whom I see before me, as well as myself, have often been called in to settle between landlord and off-going tenant, and sometimes between the two tenants who are off-going and incoming. To my great astonishment, I have sometimes found that the arbitrator for the off-going tenant contended that ten loads of manure per acre were sufficient for an acre of fallow. I said, "Far too little." The answer was, "You find very few farmers give more." I have heard the same doctrine held out on other occasions. The sooner such arguments as these are done away with, the better. Now, let us see what these ten loads of manure have to do: First, a crop of wheat; second, perhaps, a hay crop; third, grazed; and fourth, ploughed out of lea for an oat crop; and, if you should happen to suggest to the tenant to graze more of his land and plough less, the answer is, that the land will not graze. Now, gentlemen, how can it do so with these ten loads of manure? I say that the fallow ought to have, per acre, ten loads of good dung, and forty bushels of lime every second course, provided the land is adapted for lime; and, if not, never give less than eighteen cartloads of good manure per acre, or an equivalent of other manure equal to that amount; then I sincerely believe that it would amply compensate the tenant for the extra outlay. I now take the land in seeds. All land that is not worth 20s. per acre to farm, if you want for hay, I advise you to top-dress your seeds in the spring of the year with good artificial manure to the extent of 25s. per acre, and you will get per cent. for your outlay. Perhaps some one in this company will say, "It is all very fine what you suggest, but what is to be done with these poor cold soils that are not worth 15s. per acre to farm?" Let me see if I can suggest any better

mode for this class of land which will pay the tenant better than breaking it up with the plough. Lay down this land to grass, as I suggested before, except that I would recommend, for land of this quality, when laid down, to have two Winchester bushels of the best perennial ryegrass seeds with four pounds of mixed clover seed. You will then have a thick set of grass. Do not eat this land too close the first year, and take care that you depasture it with a mixed stock of cattle and sheep. I now put the question to every practical farmer I see before me, that, if fifty acres of land of these poor, cold soils be laid down as I have prescribed, which, at 15s. per acre, the rent will be £37 10s.—now put on fifty Cheviot ewes to breed from, that is one sheep to the acre, and if they have common fortune probably would be seventy lambs. And these worth 20s. each will be £70, that is leaving for the tenant £32 10s., there is the wool besides which I set against casual losses. I do not intend saying what kind of cattle ought to be kept on each respective farm in the two counties—this I leave to the tenant's own discretion; climate and soil have a great deal to do with it. But this I think I can fairly say: select a good breed of any sort, and pay proper attention to every animal on the farm, particularly the first year of their growth; this is most essential. If you half hanger them the first year, you will find that what you have lost by so doing cannot be obtained again. In selecting a bull invariably inquire if his dam was good at the poll, and if you can get the fattening and milking propensities combined together you will do well. And, in conclusion, allow me to revert back to the fallow land; that if such was properly drained and well limed I sincerely believe that there is scarcely an acre in the two counties but what would grow green crop; and if left to the spring of the year to be cut off with sheep and afterwards sown with oats and proper grass seeds, the land would be in better heart and pay the tenant considerably better than it would do if sown with wheat. I further believe that one-half of the arable land in the county, if properly managed, would produce one-third more than it is producing at the present time; and that if one-half of the arable land which is at present under the plough was put into grass, I have no doubt at all in my mind but that it would pay much better than the way it is cultivated at this time. One word more and I am done. Meadow land, if mown, requires top dressing; why not top dress your inferior grass land? Try the experiment, and you will find it profitable. Give the land, the third year after you grass, 1 cwt. per acre of nitrate of soda and 2 cwt. of ground bones, mixed together, and you will find that you are amply paid. I now leave these few imperfect remarks to your consideration; and fearing that I may have trespassed on your patience, I beg to thank you all for the kind attention which I have received.

The Rev. JAS. SIMPSON said: Though I have no practical experience in the matter, I have no objection to make a few remarks by way of opening the discussion. Mr. Moffat has treated his subject remarkably well, and has propounded principles to some of which we shall all give our ready assent without any argument. His advice is—drain your land well, clean it thoroughly, and manure it sufficiently. These are three essentials which all will admit, and not one can dissent to as a general rule; but when he comes to treat the subject in detail it becomes a question whether drainage will pay on some lands. Will it pay on clay lands? He says it may be done for five per cent. It might have been done so, but if a landlord now wished to drain his land he cannot do so for less than seven per cent. I am assuming that it is land worth 15s. per acre. He says that if you lay down land in grass, drain it, and pass it through the regular course, it would be very profitable; and I think it would be well if some practical farmers will say if this would be the result with some of the clay lands they have to deal with. I quite agree with him that with the present practice, with the ruling price of corn, these poor clay lands will not pay the farmer to work out the four courses. That is a question which you are now called upon to discuss; and there are other points to which attention may be turned with great profit in reference to the kind of seeds you ought to sow on this land. Mr. Moffat recommends two Winchester bushels of perennial ryegrass and four bushels of clover. I believe, however, that many farmers think that they are using sufficient ryegrass already, and that they would get more both of hay and pasture if they used no more ryegrass. How this may answer, I don't pretend to say; they are points for dis-

ession, and especially that point of sowing seed on land which he values at 15s. an acre. Mr. Moffat would take all land worth more than 20s. an acre, and turn it into pasture; and he recommended an expenditure of 25s. per acre as top dressing—

Mr. MOFFAT: No; not to exceed 20s.

Mr. SIMPSON: I have no doubt it is a practical suggestion in some cases, and you will judge of the kind of land he means. He says you ought to spend 25s. an acre upon it for top dressing to make it pay. It is a most important suggestion if feasible, but you won't adopt it without full discussion. I am making these remarks only for the purpose of raising discussion. I give no opinion myself; you are your own judges. Mr. Moffat would at once recommend that an arable farmer—say of 200 acres—should endeavour to get a quarter of that into grass. There is generally, he says, attached to the home-stead twelve or thirteen acres of holm land; he means meadow. But when he advised to convert all we could into grass, he did not tell us what sort of land the advice referred to, but only illustrated it by reference to the course pursued by a friend. It is worthy of consideration, however, first of all, how to convert this 200 acre farm into grass; then whether it would pay to do so; and, thirdly, whether it could be profitably kept so. It cannot be said that Mr. Moffat has been speaking without his book, for he has given evidence of great study and experience, and it is quite clear he knows what he is about. It is certainly very difficult to pick holes in his case, however pleasant such an operation might be. The Chairman has assigned to me the duty of opening the discussion, so that I should find fault with him if I could. I think that to prove the expediency of converting land at 15s. an acre into grass land is rather a difficult question to deal with. It is a problem that has not yet been solved, and if this club could solve it, it will confer a great benefit upon numerous landowners, whom I should shortly expect to present us with a piece of plate for having discovered for them the secret.

Mr. MOFFAT: You have said nothing of the thistles that grow in the hedges.

Mr. SIMPSON: Because we are all agreed about that.

The VICE-CHAIRMAN: The subject of clay land ought to be more thoroughly ventilated. I rather coincide with the view of Mr. Simpson about whether it would be more profitable or not. If I understood Mr. Moffat aright he said he would recommend the laying down the worst part of the 200 acres, land not worth more than 15s. an acre.

Mr. MOFFAT: Yes.

The VICE-CHAIRMAN: It is well known that land at that price cannot be kept under the plough with the price of corn what it is at present. Mr. Moffat then suggests that it should be grass—that it should be laid down with seeds. I think he is right, but I should like to know if it would continue to pay to be kept in grass. If so, all Skelton and Broadfield could be done now with advantage; but would that land keep sheep and yield a profit? If this can be done I have no hesitation in saying that it will be much more profitably farmed than under the plough. I should like to know from Mr. Moffat whether he is aware of such land having been laid down in grass and continued in grass, and still paid the farmer a profit.

The CHAIRMAN: Before Mr. Moffat replies to Mr. Heskett's questions I should wish to say that I think your remarks were very general as to calculations. I think you mentioned Sowerby Pasture.

Mr. MOFFAT: I did.

The CHAIRMAN: Did you mean to include that very wide district of this part of Cumberland which is considered by many to be capable of great improvement—Broadfield?

Mr. MOFFAT: I did.

The CHAIRMAN: I ask the question, for some of the members of this Club are from that district, and if you did intend to allude to that district it might make your remarks not more personal, but more practically interesting to them, for all over Broadfield I think it will be admitted there is more room for improvement than in any other part of the district.

Mr. MOFFAT: In reply to Mr. Heskett's question whether such land as he has referred to could be profitably worked and continued under my system, I don't mean to come here and tell gentlemen what they are better able to judge of than me, but I merely submit the proposition for discussion, having myself had practical experience of its success. I have land not worth 12s. an acre; it has lain in grass for twenty years; and I top-dressed that grass, and it

paid me cent. per cent. I cannot speak to a large extent, but my practical experience makes me believe that the inferior sorts of land, if laid down properly in grass, would pay; otherwise, the question arises, how, if land will not pay in grass, it can be expected to be profitable worked with cropping. I say, then, let that land be laid down, drained thoroughly and properly, cleaned of all obnoxious weeds, and put seeds in. Don't go away with the idea that without draining the experiment will succeed. I tell you that if these conditions are attended to it will succeed; and I would advise the members of this Club to try it, even though on a small scale at first; and if it does not answer, I will admit I am wrong, and know nothing about it. At the same time, I only speak of what I know to be the case elsewhere; and I do believe that if you top-dressed your grass, in three years you would restore it, and that your animals would do better, and give you a much larger margin of profit. Look at nature in its primitive state—there is no cultivation there, and yet you see grass growing in its original richness and luxuriance. Why, then, should not the lands referred to be brought back to that state by good treatment? We manage our wheat crop; we manage for all other crops; and why should we not manage for our grass crop? Our worthy Chairman has referred to Sowerby. The soil there is one of those tenacious, retentive clays, so difficult to deal with; but I believe if that clay were properly cultivated—thoroughly broken through by deep ploughing—much wealth may still be obtained out of that land. Till that hard clay "till" is broken through you need never expect to succeed in cultivating the land. And again, as to Broadfield, I believe also that if the land there were properly drained it would pay, under good management; for though the soil is not so retentive as that of Sowerby, it is land which will grow a green crop, and green crops are the most profitable crops that a farmer can show on his land. Let it not be misunderstood—I don't mean potatoes: let it be turnips, and consume as much as you can on the ground with sheep. If you do this, I can promise you that even on that land you will pay your rent every year, and have something to lay up for a rainy day as well.

Rev. J. SIMPSON: There is one subject which you have drawn attention to which has been forgotten in the discussion, that is autumn ploughing—ploughing in November after your fallow.

The VICE-PRESIDENT: I wonder what Mr. Nicholson's opinion is upon that head; he has got a steam-plough, and could tell us something worth hearing.

Mr. NICHOLSON: I have certainly listened with pleasure to the paper of Mr. Moffat, who is an old friend of mine, I have known him a long time, and have heard him let fall many sound and sensible remarks, but I beg to differ from him in some things this time over. There are some of his suggestions that I should have scarcely thought a man of his age and experience would have introduced, especially in the nineteenth century. He said he would take three pecks of Italian rye grass.

Mr. HESKETT: He said two.

Mr. NICHOLSON: He said three once over.

Mr. HESKETT: No; it was his friend who said three.

Mr. MOFFAT: I should only recommend one on poor soils.

Mr. NICHOLSON: When I began farming, I thought I did not sow enough rye-grass, but I soon found that I was mistaken—that I sowed a good deal too much; and with it that I sowed a good deal of filth that I never bargained for. My experience now is that the best way to deal with it is to sow very sparingly of rye-grass, on clay land particularly. Since I took my present farm I have had experience in growing clover, and my admixture of clover and seeds before I remove them from the seedsman's coats 18s. 6d. per acre; but for this I got 5 cart-loads of hay, and twenty cows have gone on it every day for a fortnight since the crop was cut. That was with seeds, with six quarts of rye-grass.

Mr. JAMMSON: What is the rest of them?

Mr. NICHOLSON: About 14lbs of clover.

Mr. MOFFAT: What is the worth of that land?

Mr. NICHOLSON: Why it stands me in 40s. per acre; but I have other land which stands me in 11s., where wheat is grown, but it has been drained at an expense of 47 10s. per acre, or 5 per cent. upon the outlay; it has had ten cart

loads of lime per acre at 8s. per ton. With this and the taxes you may easily imagine that in the end it stands me in more than 11s. But as for this land at Sowerby Row, you say it must be drained and limed. You cannot drain it for less than £7 10s. an acre; that lays the value up to something. Then there is liming, and ten cart-loads of manure, and the top-dressing as well. All these things add to the price of the land.

Mr. MOFFAT: Before you sit down—

Mr. NICHOLSON: But stop a bit; I've a good deal more to say yet. Mr. Haskett has referred to a subject which I should like to speak about—as to the breaking up of the strong clay land, and about my having a steam cultivator. My idea of Sowerby Row is that there are no tools there fit for the work required; no implements capable of cultivating the soil; their horses are too weak, and the only way they can get through the clay must be by the steam cultivator. Drain it well, plough it ten inches deep, and then I will undertake to say that none of us with our light soils will be able to grow turnips half so well. But this is not within the scope of the common farmer. Landlords must put their shoulders to the wheel, and get all these done. One steam ploughing is worth three ordinary horse ploughings; besides which you are unable to engage in any other work when horses are ploughing, which is not the case with the cultivator. The steam engine does not want corn nor rest, and it can go on continuously without stopping, till the work is finished; and it is of great importance to you, that. I am quite convinced from my own experience that the more steam cultivators can be seen the more they will be used. My men who worked the steam cultivators were of opinion that it did more work in one day than could have been done with the four best pair of horses upon any farm.

Mr. SIMPSON: What about November ploughing?

Mr. MOFFAT: Mr. Nicholson has stated that he does not agree with me as to the quantity of seeds, and has given us an instance of the result of sowing a field with clover—land valued at 11s. per acre. What I suggested, was to be done with the view of converting such land into permanent pasture. I find, however, he ploughs his field out, and puts it through the regular course. The question I would ask him is—Does he lay that 11s.-field in permanent pasture? [Mr. Nicholson: "No."] My argument is to do away with the plough and the harrow in Cumberland and Westmoreland. I should like to see one-half of what are now used done away with entirely. Nothing would please me more than to hear that ploughed land paid better than grass land; but, if any gentleman can show me that, then I will admit that I know nothing about farming in Cumberland. If any gentleman will show me a greater profit accruing to ploughed land over grass, I am open to conviction, and will submit; but the special object of my addressing you to-day is to lead you to consider whether fallow or ploughing is the more profitable. Mr. Nicholson says he should like to see landlords assisting tenants by procuring steam apparatus to apply to the work of the farm. But, if we take either Cumberland or Westmoreland, they are both hilly counties; and, such being the case, will these steam apparatus answer the purpose? It may answer in isolated cases, such as Mr. Nicholson's, where the ground will admit of their application; but, if you go to Brayton, where a man has carried out the system at his own expense, I'll be bound to say that he never paid his landlord (his father) one shilling of rent. The money spent upon that farm would have broken all the landlords of Cumberland. But the tenant has a capital landlord in his father; and every man who has a father for a landlord has a good landlord. In ordinary cases, when rent-day comes round, it is expected that the farmer should pay his rent; and, if he says, "I can't pay my rent," the landlord feels very sorry, and so does his agent, for we all wish particularly to see that done.

Mr. NICHOLSON: Your friend, at Brayton, bought his own steam apparatus, and that was the reason why he was not able to meet his father on the rent-day.

Mr. HOGARTH: I don't know that anyone could listen to this discussion without gaining some knowledge; and it is very proper to have such discussions. It seems, however, that Mr. Moffat and Mr. Nicholson are at variance about sowing seeds.

Mr. MOFFAT: Don't say at "variance."

Mr. HOGARTH: Then you submit, if you are not at variance?

Mr. MOFFAT: Certainly not. But that is not the word.

Mr. HOGARTH: One word about the top-dressing recommended. He would have the field top-dressed every three years, at 30s. an acre [Mr. Moffat: "25s. an acre."], with two cwt. of bones; and that, without the cost of application, would come to 25s. per acre. These are considerations for the rent; and the sheep are not kept yet. But what I wish to draw attention to mainly is not to use nitrate of soda and guano.

Mr. MOFFAT: I said, nitrate of soda and bones.

Mr. HOGARTH: I want you to take the light manures and the bones, and try to elicit some information as to the result. My own experience has been (though a dealer in guano and bones; and I am now a user very largely of them)—I have come to the opinion that nitrate of soda and guano are robbers of the soil. If you have no "muck," you cannot get it to pay; and, if you have not that resource, you must go to the bone-shop; for, without farmyard muck, nitrate of soda and guano, though very good for some things, will be no use to you in helping you to pay your rent to the end of your lease.

Mr. MOFFAT: I suggested the top-dressing once in three years upon the poor soils, or upon any soils we intend growing and keeping in pasture. My friend, as a guano merchant, if he did not find the shoe fit, need not have put it on, and then it would not have pinched him. He says that nitrate of soda and guano are "robbers," and yet nitrate of soda, with bones, will produce an abundance of grass that would astound farmers if they would only try the experiment. I went the other day to value a farm at Barton Hall. There was a field with a spring in it, and so I called it the "pool-field," the tenant having no name for it. I told him I was quite astonished that the field should have such an excellent crop of grass. "Last year," he said, "it did not carry five milch cows. This year it has fed (it was a seven-acre field) eight milch cows and three bulls." The value of that land was 32s. per acre; and I never was more struck in my life than I was with the appearance of that crop of grass. I asked the farmer what he put on. He said, "One cwt. of nitrate of soda, and two cwt. of bones; and see what it has produced." I wish every farmer knew how to manage his grass land in the same way. I don't come here to say that I am wiser than you, or can manage a farm better. All I want to do is to endeavour to secure some improvement in the cultivation of your grass lands; and, if I could throw out any hint that may be useful to the members of this club, that is all I look for. Mr. Hogarth says I have not answered Mr. Haskett's question. Perhaps not; but I would advise my friends to try the experiment for a few years, even on a small scale, and, if they don't see the advantages, they may set me down as knowing nothing about it. Landlords and tenants are sailing in one boat; and it is a great consideration for every landlord and tenant, if their farms are to be made to pay, that these matters should be understood. Let me tell you that no man will prosper if he hungers his land. He cannot expect to produce anything unless he puts something in it. In these inferior lands, unless you do so, you will certainly get nothing; whilst, if you encourage them fairly, you will get cent. per cent. on your outlay.

Mr. LANCASTER said: It is with due deference to Mr. Moffat that I rise to address this meeting; and I thank him for his introductory remarks. I cannot say that my views altogether agree with the didactic part of his observations; yet, upon the whole, the paper he has read is calculated not only to edify the members of this club, but also, through the medium of the press, the whole of the farming community in this locality. I am sorry I cannot speak from experience as to the best mode of managing all classes of arable soils. The farm I occupy is of a porous nature, varying from a coarse palpable sand to that of a friable loam. I have had frequent opportunities of visiting farmers who are occupiers of argillaceous soils. Consequently, from the information I received from the holders, and my own observations, I may have gained a little theoretical knowledge. It appears to me that, to restore exhausted soil speedily to its natural fertility, whatever may be its nature or character, requires two great fundamental principles or operations on the part of the farmer. The one may be termed mechanical—the other, chemical; and, in order to give full development to these functions, the farmer must be the possessor of a considerable amount of capital. Various are the opinions as to the requirements of

the farmer in this point of view. It is thought by some that there is at present not more than £3 or £4 per acre employed by many farmers in Cumberland and Westmoreland upon arable farms. As a practical man, I should say that this sum is altogether inadequate to the requirement; and I think no one ought to come into the farming field unless he has at his command at least £6 per acre; or even £8 per acre might be employed to advantage upon good soils. It is very well known to all practical farmers that it is essentially necessary to have the soil well pulverised and consolidated, which involves considerable cost for mechanical power, so that I need not enter into detail. I quite agree with Mr. Moffat as to the destruction of all obnoxious weeds, and the cleansing of hedge-rows as well as of pastures; nevertheless, I am of opinion that too much money is expended by some farmers in cutting down and carting away from their pastures twitch and other nutritious weeds. I was told a month ago by Mr. Hesket that if he were not to cart off his twitch and other weeds he should soon be ruined. One of my predecessors (who occupied my farm some time ago) was said to have left £5,000 behind him.

Mr. HESKET: I hope you have found it. (Laughter).

Mr. LANCASTER: I am sorry to say that if he did leave that sum of money he did not leave it upon the farm, otherwise I might have found it. He employed thirty hands at a time picking and burning twitch at a very large expenditure of money, during the summer months, carrying on a war of extermination like Saint Patrick with the toads in Ireland; but it appears that the farmer's warfare with the weeds was not attended with the same success as the holy father's raid against the toads. Pat twitched the toads to some purpose, and exterminated them entirely; whereas the farmer, when he came to crop his land again, found that the weed had come up again as rank and luxuriant as ever. The result was that at the end of nine years' incessant fight, the twitch kept the fields, and the farmer hid back to Scotland, where he came from. I have occupied that farm for seven-and-twenty years, and, with the exception of the first seven years of my occupancy, I don't think that it has cost me 10s. per annum to pick twitch and rape seed, and I am not quite "ruined" yet, Mr. Hesket. It will be time enough to knock under when I leave the field of battle; it may be that twitch may yet give me a broadsider, and that I may have to succumb like my predecessor. However, be this as it may, in my opinion the best way to keep twitch under is to plough, harrow, and to sow in their proper seasons, and, above all, to give a proper and adequate supply of fertilizers, in order to secure good crops. But if the farmer does not secure good crops, then twitch and other pernicious weeds predominate. This is an inevitable law connected with Nature. As it regards the chemical process which I have alluded to, this Nature will perform herself, in her own laboratory, governed by her own code of laws: but it is left to the farmer to supply her with a proper equilibrium of elements in the shape of fertilizers. And the man that attains to the knowledge of the proper requirements of Nature, in this point of view, may be termed a scientific farmer, or a man that is master of his profession. During the last twenty years a great change has been taking place in the agricultural world; it has been a period of transition; we have been urged by the professors of chemistry to try experiments, and to try again. We have done so; and the result has been alternate failure, success, and failure again; consequently, we have experienced, to our mortification, great losses; and it would be very well indeed if this Club would arrive at some definite conclusion as to the best mode of managing arable farms. When first guano was imported into this country the farmer was so elated with the successful results which it produced that it became quite a proverb that it was much better to sell straw and to buy guano; but strange to say, when it was applied again to the same soil, it was not accompanied with the same success; and the third time, it was a comparative failure. The same may be said of all guanoes and British fertilizers, differing only in this—that they were not so successful on the first application. The farmer, from experience, has found that there are no artificial manures yet brought into the market that enable him to keep up the fertility of his soil without the aid of farm-yard manure. As to the why and wherefore, I never yet have heard it satisfactorily explained. I fully expected Mr. Moffat would have entered into an exposition of his views upon this

head, as I think it constitutes the cardinal point. From a careful observation of nature, and comparing the result with the works of learned professional men, I have ventured to form an opinion of my own as to the "why and the wherefore," which I have no objection to submit to this club, not in the belief that it will edify the members to any considerable extent, but that it may elicit the opinion of others, and excite the eloquence of the learned. We are told by the analyst that guano possesses the same fertilizing constituents as it did when first imported (and we have no right to impugn the veracity of his statement); I ask, then, why is guano attended with alternate success and failure? It appears to me that it eventuates from the peculiar laws of affinity—the silicates having strong affinity for the bases, both organic and inorganic. There are various kinds of silicates; for instance, those of lime, magnesia, and potash; but when I use the term "silicates," I mean the silicates of aluminum, or, in plain terms, sand or clay. My opinion is that the element of aluminum has the strongest affinity for silica, and that they unite according to their relative equivalent. It is then called a silicate, and has a strong affinity for the bases; for instance, it will take hold of the alkaline base soda, and enter into combination with the same; and while in this state there are no rains that fall from the atmosphere that can carry it away. But if lime be applied in sufficient quantity, then the silicates take hold of the lime, and replace the soda, which exposes it to be drained away with the water. Then, again, magnesia will replace the lime, and this, in my opinion, is the reason why the magnesian limestone is not so valuable as the carbonaceous stone in an agricultural point of view. Magnesia is a dangerous fertilizer to apply in large quantities; potash still more so, as it will replace magnesia; and, lastly, the very peculiar organic base ammonia will replace the whole inorganic bases, and form a double-silicate of ammonia. Farm-yard manure has a large percentage of potash in its composition. Peruvian guano is very much deficient in this alkaline, and the same may be said of bones, as they contain only a trace of this very useful base. During a lengthened period of time farm-yard manure was the only fertilizer, probably so to speak, that the farmer applied to his soil, and this manure, containing a large amount of potash, became incorporated with the soil, so that it might be termed a double-silicate of potash. You will very readily conceive what is now wanted; Peruvian guano, which, as I have already said, contains little potash, it has in its compound all, or nearly all, of the other fertilizing constituents, especially ammonia. This is the very manure the land requires. The ammonia removes the potash, and it becomes available for the crops to assimilate. The result is abundant crops, I wish it to be observed that at first when guano was imported into this country, they were very fine propitious seasons; had there been wet summers its application might not have been accompanied with the same success. Now, the farmer carted away those large crops that I have mentioned, in the shape of cereals, which contain a large amount of potash, and, calculating upon guano being all that is required as fertilizers, does not apply farm-yard manure; consequently, it is natural to think that potash is not returned in sufficient quantity. Hence, the second application of guano to the same soil was accompanied with less success; and a repetition (for the third time) of this mode of management, it is hardly necessary to say, was a comparative failure. Land that is destitute of potash cannot be restored to its natural fertility with bones; consequently, what must the farmer do? Must he, too, abandon the use of bones and guano, and give a double dose of farm-yard manure? By no means. I differ with Mr. Moffat, in saying that ten cartloads are not sufficient to manure an acre of ground. A large application of manure may be attended with success or comparative failure. For instance, if twenty tons were applied to the acre, in the month of June, and there came a very heavy fall of rain in July, the silicates hold a large amount of potash that is also contained in the manure, and it may be the magnesia; but the other bases are carried away in the solution with the water. The crop, after this, assumes a sickly appearance; and the farmer always points to that wet day as the cause of the comparative failure of his crop; whereas, if he had had a proper equilibrium of fertilizers, the rain might, to a certain extent, have done good. Or, had it been a fine sum-

mar, with no very heavy falls of rain, the large application of manure might have given satisfaction. I would recommend, therefore, in order to secure success to the clay-land farmer, ten cartloads of farmyard manure to the acre; for here we have the carbonates, especially a potash—four cwt. of ground bones. This ensures the phosphates (two cwt. of Peruvian guano) which give the ammonia; and in no case would I recommend more than two cwt. of Peruvian guano, as it is most dangerous to apply a large quantity of ammonia to the soil. And if the mechanical operations of the soil and the seasons be properly attended to, I will pledge my word that six years out of seven it will be attended with success. For porous soils, I would recommend eight cartloads of farmyard manure, five cwt. of bones, and 1 cwt. of Peruvian guano to the acre; and this will, in my opinion, also ensure success, except in those very peculiar seasons which baffle all human skill. Then, again, with regard to laying down lands to grass, it greatly depends upon the geological character of the soil. There is a class of land in our country that is well adapted to grass; but there is also a large breadth of land that, to lay it down to grass, would be to lay it down to waste. About fifteen years ago, at the suggestion of my landlord (Sir George Mesgrave), I laid one rotation of my farm down—that which was best adapted for grass; and he kindly permitted me to manage the rest of the farm under the five years' system, which mode has answered very well. Therefore, I would recommend that the best soils be laid down to grass. In doing this, very sound judgment must be exercised, grounded upon scientific principles as to the character of the soil that will be remunerative to the farmer, and also that which will not. I would strongly recommend the five-course system to be adopted, more especially as the arable land would then consist of the inferior soils. First oats, then turnips, then barley or oats, and two years grass; and to be very careful never to omit in any one year the top-dressing of the seeds. I am not a believer in the doctrines of Mr. Mechi, as it regards the giving of oilcake to animals at grass upon clayey soils. If you were to lay heavy cattle upon your pastures and feed them with oilcake, and it were to come a heavy fall of rain, you would find that the mechanical operation, or the treading of the cattle upon the land, would act very prejudicially to your interests, consolidating the soil far too much. Give fertilizers in spring—say 2 cwt. of Peruvian guano—and this will prove a pulveriser also; then the result will be that you will have a rich and luxuriant crop of grass in the month of May. Be

careful to put on young cattle; Cheeshire and Lancashire calves can be had in the markets in the autumn. These might be kept for one year, then sold to the dry-land farmer, who requires heavier cattle, in order to consolidate his porous ground. This mechanical operation will contribute vastly to the interests of the sandy-land farmer, as it is well known that it assists in keeping up the balance of power in the grasses. Indeed, I don't know how many considerations apply to the farmer: farmers ought to be geologists, chemists, and lawyers, as well as agriculturists; in fact, he ought to be everything.

The Rev. J. SIMPSON then moved the thanks of the meeting to Mr. Moffat for his very interesting lecture, and he could hardly remember a more valuable discussion at any time than had arisen upon it. Mr. Nicholson's remarks had been exceedingly applicable, and he knew how accurate they were from his own experience. They might go a long way before they found seed crops so luxuriant as Mr. Nicholson's. He was glad, too, to find by Mr. Lancaster's able address, that farmers were at length turning their attention to scientific farming, and he was sure that many of them would be induced to apply themselves with greater diligence to the subject by Mr. Lancaster's remarks.

The VICE-CHAIRMAN seconded the vote of thanks.

The CHAIRMAN, in putting it, made some complimentary remarks, and said the Club were greatly indebted to Mr. Moffat, not only for his interesting lecture, but also for the valuable discussion it had given rise to. He agreed with a great deal Mr. Moffat had said upon the cultivation of grasses, because it was a subject he had inquired into himself, though he could not of course go into practical details. He would, however, recommend the attention of the farmers of that district, and indeed of the whole county, to this discussion, and he had no doubt the press would afford them ample opportunity by doing full justice the occasion; and he would ask the members to lay by the copy of the paper that contained the report, and in the meanwhile put down the highest price they get for their cattle and the price for their corn. When they come to read the discussion three years hence, they would have been able to arrive at a satisfactory conclusion whether it was more profitable to increase the quantity of wheat or of wool.

The vote having been passed by acclamation, Mr. Moffat acknowledged the compliment, observing that he was quite satisfied his remarks would prove like bread cast upon the waters, which would return many days hence.

OILCAKE FEEDING.

Sir.—I have been a good deal amused and somewhat astonished at the hubbub created by my remarks in Camberland about oilcake feeding. As I am particular in my facts, I will repeat clearly my statement, and then endeavour to convince my brother-agriculturists that they ought not to be astonished at those statements; because, if they are, it proves to me that they do not understand so well as the Norfolk and Lincolnshire farmers the cheapest and most effective mode of maintaining or increasing the fertility of their soils. I can easily imagine that the thousands of farmers whose animals seldom or ever see cake must regard with astonishment the facts I shall lay before them; but I trust that they will derive from these facts a determination, so far as their capital will permit, to go and do likewise—to hold less land, and put more into it. But let us look at it as a manning question, and we need no longer doubt the wisdom of our Norfolk and Lincolnshire friends. Are my brother-farmers aware that many good practical men manure their land with cake (rape and other sorts), ploughing in 10 to 12 cwt. per acre? Now there is a great maxim that every farmer should remember, that every vegetable production pays better to feed than to plough in: this holds good from a field of green rape or roots to a sack of barley or a ton of cake. The reason is obvious. The fattening animals take very little from the feed, and that little, when converted into meat, sells at 7d. per lb., or about £65 per ton, although its elements are really not intrinsically more valuable than the cake at £10 per ton (see

chemical analysis: flesh contains 77 per cent. of water—cake only 7 per cent.). When I hear a man complaining of loss by farming, I ask him "how much is your gross produce per acre?" and if I find it small, I at once understand the cause of his complaining. I except, of course, adverse seasons, of which we have lately had three, during which much capital has been lost by farmers. Speaking, however, of the average of seasons, a small gross return in produce indicates unprofitable farming. The gross produce of the kingdom is stated by Laverge and other authorities to be only £3 12s. per acre, or about 3½ rents; and I have now before me a balance-sheet of a large farm, which last year (1862) did not produce £3 per acre, and which showed a considerable loss. However poor the farm may be naturally, the gross produce ought to be made £7 per acre, and if much purchased food is used, even up to £11 to £12 per acre. It is easy to understand that the fixed per-centage of charges for rent, tithe, labour and horse-labour is considerably diminished by a large return. The Norfolk, Lincoln, and other good farmers understand this well, and "go in" for large meat-making and manure-making, by purchasing and consuming food brought on to the farm, to restore the fertility taken away in the wheat and barley crops sold. This is what makes Norfolk and Lincolnshire the meat and bread-makers for London. The Smithfield returns confirm this. Well, then, having said so much, I will go to the point upon which I was so snubbed by Professor Voelcker and others at the last meeting of the Central Farmers' Club.

First, let me say that the farmers with whom I occasionally associate in these districts are "practical men," living by their business, and I may safely say knowing well what they are about. A few years ago, my friend Mr. John Hudson, of Castle Acre, West Norfolk, was driving me from Lynn to his house, and I saw in the road thirty-five great five-year-old Devons, as fat as many we see in the show at Christmas. I said, "What extraordinary bullocks!" This was in July. "Well," he said, "these are mine; but I did not intend that you should see them until to-morrow." I said, "How are you feeding them?" He replied, "They were working bullocks; and after they had put in my 300 acres of barley, I began with 5lbs. of linseed cake a day, and gradually increased their allowance; they are now eating 20lbs. of cake a day." I said, "What do they have beside?" "Well," he said, "what they like on the pasture and in the yards; but they won't eat a great deal besides the cake." Last year, in a company of farmers, I asked, "How is friend Hudson feeding his animals?" The answer was, "He has some great short-horns; they get 28lbs. of cake a day, half a peck of bean meal, and what hay and turnips they like to eat." A farmer present (Mr. Fuller) said, "I once fed a lot of great Lincoln beasts on cake and straw; they actually at last ate 28lbs. of cake each per day." Discussing, on the same occasion, the quantity of stock made per acre, Mr. Leeds, one of the company, was pointed out as one of the greatest meat-makers in Norfolk; and on enquiry I found that he purchased, on a farm of 1,200 acres, from 250 to 350 tons of linseed cake per annum, probably at a cost of £2,500 to £3,500 per annum. "Sometimes," he said, "I lose, and sometimes I gain by it; but the corn crops always feel the effect of it." Again, Mr. Hudson told me that, during his long tenure (25 to 30 years) of a farm of 1,200 acres, he had expended £70,000 in cake, and £50,000 in artificial manures; and, as he jocularly said to his landlord, "The top or ploughed soil is mine; I made it; the subsoil belongs to your lordship." Now, sir, these wise and successful men know quite well that small crops on land naturally poor and thin won't pay, and they go in for cramming it, and forcing from it great corn crops. I remember once, in a favourable season, seeing on Mr. Hudson's farm 8 wheat stacks, from a 40-acre field—the produce 8½ quarters per acre. This came of stuffing, and the loss on the cake was made up by the increase in the corn. On the ordinary "bread and cheese and no cake" principle, the natural crop of that thin soil would probably have been 4 quarters per acre. These farmers don't trouble themselves about the animals' digestion; they want the cake in the land, and they know that it is more profitable to pass it through the animal than to plough it direct into the soil. People who jeer about 20lbs. of cake a day never tried what an animal will eat. It is no uncommon thing for my fat sheep on clover to eat 2lbs. of cake per day, which is equal to 16 or 18lbs. for a bullock. Of course they must have water to drink. I know of a case in my own county where a cow, having got access during the night to the oilcake bin, ate 55 cakes, or more than 112lbs. My friend was alarmed for the cow, but she carried it off very comfortably. There is no mistake about it: many a poor farm that is now unprofitable might be rendered remunerative by the abundant consumption of cake. I know a case where half a field of rape was folded with sheep eating cake, and the other half with sheep eating corn, of the same cost. The cake side, in the following barley, produced 2 quarters per acre more than the corn-fed side. This was not far from my farm. Therefore don't let my "uncaked" farming friends laugh at me any more about my Cumberland speeches, but rather "go and do likewise," and so improve the condition of their breeches pockets. Many farmers are not aware that when they have given to their bullock 3 bushels of roots, weighing 150lbs., he has had only 15lbs. of dry food mixed with 1½ gallons of cold water—very cold indeed in severe weather. This 15lbs. of dry food is poor in nutritive and mineral matter, compared with oilcake, for it contains a large quantity of woody fibre (see comparative analysis); therefore, if I give my animal 15lbs. of good cake (which, remember, is a cooked and well-prepared substance), I have afforded it a much better dinner than the turnip meal, and the manure resulting from the cake is much richer and more forcing, and will show a larger return in the corn crop, or any other to which it may be applied. Of course the cake-fed animal would, like the turnip-fed, have access to straw, and would also have

water, of which I will promise you he will drink less than 18½ gallons in cold weather.

We all farm too much land, and so complain of want of capital. Experience teaches me that our cultivation is too shallow, our manure too little, and our produce too small. No man ever ruined his root and green crops by filling the land to the depth of 2 feet with good manure. When I once told my farming friends that Mr. Bagley, of Fulham, grew 70 tons of mangel per acre, and sold them at 20s. per ton to Mr. Rhodes, the cow-keeper, there was a shout of laughter, and something said about a "crammer;" but market gardeners, who cultivate four times as deep, and manure four times as heavily as ordinary farmers, look upon such a crop as nothing extraordinary. Depend upon it, England is not half farmed; and we must give up a good many of our old prejudices, both as landlords and tenants, before we make farming more profitable. Our tillage is miserably shallow—not deeper than a common wine-glass. My practice and advice is, 'Break up your land very deep in dry weather. Don't bring the bad soil to the top, but let one plough follow under the other, and put on plenty of manure, and so grow as many roots and as much corn on one acre as you would by ordinary cultivation on two acres.' This is my advice; but, being "gratis," I fear it may not be sufficiently appreciated.

Tiptree Hall, November, 1863.

J. J. MENCHI.

P.S.—I find, on making up my live stock account annually, that, after paying from £500 to £700 for purchased food, I get from £5 to £6 per acre for my green and root crops. The sewage irrigation helps me on my Italian rye-grass, and my stock consume (out up and steamed) all my bean straw, and much of my grain straw. I have reason to believe that this is a more favourable result than is generally obtained where much purchased food is used. Since writing the foregoing, a neighbour, who farms 230 acres of very heavy land, undrained, has just called, and says he loses £400 this year. On my asking him as to his live stock, he says he has 4 cows and 10 pigs. How can corn be grown without manure? On my own farm, which is only 170 acres, I have nearly 70 head of bullock, cow, and calf stock, and 100 sheep, besides pigs. Unfortunately, I know of endless cases similar to my neighbour's.—I have just returned from Cambridgeshire, and find the best farmers there using great quantities of cake and meal in feeding.

SALE OF MR. LONGLAND'S SHORT-HORNS.

On Thursday, Nov. 26, the shorthorn herd of Mr. James Longland, of Grendon, Northamptonshire, were submitted to public competition by Mr. H. Barratt, auctioneer, of Northampton. The well-known blood and character of the cattle drew together a large attendance of breeders and agriculturists from that and the adjoining counties. Nor were they disappointed: the size, symmetry, and excellent quality of the herd elicited many commendations, while the honourable manner in which the sale was conducted entailed great credit on all concerned.

The herd consisted of 25 females and 4 bulls, and the sum realized for the 29 was 740 guineas, or within a fraction of £26 16s. per head; seven dairy cows and heifers, eight fat cows and eleven yearling steers were also sold; so that the sale produced in all £1,246 15s.

The females were nearly all descended from the herds of the late Earl Spencer, Mr. Bolden, of Hynning, and Mr. Robinson, of Clifton Pastures; the latter gentleman's bulls having been principally used by Mr. Longland. The highest price was 50 gs. for Crinoline, by Aaron Smith (12331), purchased by Mr. Oliver, of Sholebroke Lodge; and the next 44 guineas, for Daisy, by Colonel Towneley's Hogarth (18030), bought by the Rev. J. Storer, Hellidon. This gentleman also purchased five others. Mr. Simmons (agent for the Rev. C. W. Holbeck, Farnborough Hall); Mr. Chapman, Whitwell, Mr. Davison, Easton Maudit, Mr. Adcock (Farndish), Mr. Lucas (Weedon Lodge), Mr. Markham (Northampton), &c., were also considerable purchasers. The fine old bull Hayman (16245), weighing 23 cwt., was sold for 40 guineas; Field Prince, bred by Mr. Jous Webb, for 39 guineas, and two bull calves for 38 and 26 guineas respectively.

SUBSOILING LAND BY STEAM.

Where land is properly drained either naturally or artificially, and when the subsoil has become consolidated or run together either by water, ferruginous, or other agents, there is nothing that pays the landlord or the tenant better than subsoiling. In the absence of efficient drainage, however, it is about one of the wildest dreams imaginable, often doing much more harm than good. As a plain question of fact, subsoiling is neither more nor less than a species of drainage in all cases where it proves beneficial, just as thorough drainage is a kind of aération. Thus the best artificially drained lands are those whose aération is the most successfully effected.

There are, however, two processes by which the ground is over-moistened with water, and two methods of drainage—the one involving the removal of bottom or spring water, and the other the removal of the superabundance of rain-water that falls from the clouds. A drain that effects the removal of the bottom water may be equally successful in draining off what falls upon the surface of the land; but the moment we begin to associate the two with other operations, as subsoiling, or aération, or the removal of plants yeilded weeds, differences arise that require practical consideration.

We have been led into this inquiry from the query of a correspondent, who under the signature of "A SUBSCRIBER," asks, "What is the most economical method of laying down strong land for permanent pasture? And can subsoiling abolish the weed called in Lancashire 'cat-tail' or 'toad-pipe'?" Instead, however, of giving a direct answer to this, we propose the broad question as a general one, which involves the removal of weeds of every kind, including, of course, the abovementioned.

That subsoiling can be profitably performed by steam is a problem that requires no proof, and that there is an immense area of land, more especially strong clayey lands and subsoils, that are bound together or greatly consolidated by ferruginous agency, which ought to be thus subsoiled, is equally manifest, provided always that the drainage of such lands has been previously effected. Drainage is the real basis of successful subsoiling, as already stated; and this fact must be ever borne in mind by those who intend yoking the subsoil plough.

Where bottom water rises to the surface, so as to keep the staple soil moist, subsoiling then becomes a doubtful operation. If the land has been imperfectly drained, the work of subsoiling and deepening the staple may assist the drainage, and keep down the water to a lower level. But under such circumstances this is laying upon the head of the subsoil plough what does not legitimately belong to it; and, therefore, it would be unreasonable to suppose that the full benefits will be derived from the operation, as compared with subsoiling when the lands are properly drained. Thus, if one farmer has his land well and deeply drained, and if his neighbour on the other side of the hedge or fence has his land imperfectly drained, although both may subsoil their lands equally deep and well, it would nevertheless be unreasonable to expect equal results next harvest, much less permanently, or for the unsuccessful experimentalist to condemn subsoiling as a profitless enterprise that ought not to be advocated by agricultural writers. On the one side of the hedge cat-tail and its kindred companions may, individually and collectively, disappear, while on the other side they may flourish more luxuriantly than ever. We have, in point of fact, been eye-witness to several instances of this kind, and in the majority of these, we may add, the subsoil plough got the blame, not the farmer.

In the case of rain or surface water, if strong clayey land is artificially drained, then subsoiling will promote its percolation through the subsoil to the drains, if the work is properly performed. Thus, if subsoiled between the wet and the dry, as is generally the condition of the land immediately after harvest in ordinary seasons, and if the work has been executed to a uniform depth, rectangularly or diagonally across the drains, then the first heavy showers of rain will not only be more rapidly drawn off to the drains, but sandy and porous material will be washed into the bottom fissures and interstices, in a manner to form a species of lateral subsidiary drains that may continue and often do last for several seasons.

Much of the success of autumn tillage by steam-grubbing, or smashing up the land by steam, depends upon a species of subsoiling, produced by implements of this class. Thus, for example, strong clays at this period are generally in our southern provinces rent and fissured during the summer time to a considerable depth. Now, from the manner such cultivators tear up the staple from the bottom, this tearing process through the instrumentality of the fissures extends to a much greater depth than the shares or tines, so that whether the work is performed laterally across the drains, or longitudinally in the direction of their length, the subsoil is broken and loosened, so as to promote both the drainage and aération of the land to a greater depth than the staple.

In this respect (*i. e.*, the tearing process) the cultivator has a decided advantage over the common plough, independently of the soling of the latter and the consequent consolidation of the subsoil. For a similar reason, the less the subsoil plough soles and the more it tears up the staple from the bottom the better is the quality of the work performed and the more successful an auxiliary is it to the drains. Hence the rationale of not only making the sole of the subsoil plough short, but an acute angle and feathered vertically and laterally to one side.

One of the great drawbacks to subsoiling with horse ploughs is the tramping of the newly-loosened subsoil with the horses' feet, thereby greatly undoing the work done. To obviate this, the team that actuates the common plough ahead of the subsoiler may be made to travel on the unploughed land; but this always less or more increases draught, and, consequently, the general bill of costs. It is, however, decidedly preferable to tramping the newly-loosened soil in the bottom of the furrow, and a land bridge, or cope, is all that is necessary to permit of both horses travelling on the land.

Subsoiling by steam is wholly free from this objection. It is not only so, but the rattling pace at which the steam plough moves is greatly in favour of the work done. Putting, therefore, both these advantages together, the general gain, as compared to horses, is something considerable—sufficient to turn the balance, in doubtful cases arising from imperfect drainage and other conditions of this kind, in favour of subsoiling. And, besides these two advantages, subsoiling apparatus can be attached so easily and cheaply to the common steam plough as to reduce the prime cost to a minimum in the outset, and to very little more than the ordinary expense of cultivation afterwards. And the same data are applicable to the other class of cultivators.

Practically considered, these are invaluable advantages in favour of subsoiling land by steam. Professionally considered as an agricultural operation, the work has always been acknowledged as an initiatory step in deeper cultivation, thereby affording the roots of plants an increase in the resources from which they derive subsistence, consequently procuring from the land a greater weight of produce of a better quality. And while it effects these important results in harvest, it at the same time reduces the expenditure for manure, seed, and labour. Such being the award pronounced by practical farmers under horse culture, how encouraging is it to entertain the more promising effects produced under steam culture!

In this, as in all other branches of farm practice, the examination of the details forms the more interesting part of the subject. If we take a somewhat stubborn clayey soil incumbent on a moist bottom that naturally produces rushes and other plants of this description for an example, and if we further suppose that the land has been recently drained, but that the bottom supply of water is such as to keep the spring season late, especially in moist seasons, and, consequently, that the land is liable to bake, fissure, and literally be converted into shapeless bricks during the dry weather of summer, then the effects produced by subsoiling, if the work has been properly done, are often very remarkable. The first observable effect that demands a special notice is the comparative dryness of the land in spring, and absence of anything like running together by a heavy shower of rain when newly worked. This is more

particularly the case if the winter has been severe, and the degree of frost such as to penetrate to nearly the bottom of the loosened land. If the months of January and February have been dry and frosty, and if a wet March follows, and then a sudden change to drought, the adjoining field that has not been drained and subsoiled will run together in the wet weather like mortar, and then bake and crack when the sudden drought sets in; whereas you may drive your foot to the ankle in the land that has been drained and subsoiled. The latter has undergone one of those favourable changes of a chemical nature that is not easily explained, but which is familiar to most farmers; while the former has returned to that condition in which water plants naturally luxuriate, when it is in a moist state, and certain species of fungi, or mould, when it becomes deprived of its moisture by the drought of summer, owing to its being rent with fissures.

Between these two examples there is a wide contrast that merits a still more detailed examination to be thoroughly understood. Thus, in the case of the drained and subsoiled field, the land is more dry in winter and spring, but more moist in summer, than the land of the undrained one that has not been subsoiled. There is something in this that partakes of the nature of a paradox, but everything contradictory disappears the moment the facts of the case are recognised; for the two methods of drainage, together with the hygrometrical and thermometrical conditions of the two fields, are widely different, the drainage and subsoiling having effected a salutary change in one of them; while no improvement, or rather the reverse of improvement has been effected in the other, the nature of the season being more than ordinarily against it. In the case of the former certain beneficial changes of a chemical character took place before the rains and frosts of winter were experienced. These prepared the soil for further changes under frost, and also for the removal of matter when the rainy season set in. Thus the moment the subsoil was smashed up to the weather, the atmosphere was admitted, when the healthy process of decomposition would commence both of mineral and vegetable matter; while noxious gases are often liberated from the subsoil and rise into the atmosphere, and thus make their escape. These processes promote

the drainage of the land by percolation. In other words, they prevent the fragments into which the land is broken from running together when the heavy rains come; consequently, when the weather breaks, both the soil and subsoil undergo a further change by the process of percolation. The soluble matter that is thus washed away through the drains have a further tendency to render the soil more permanently porous and less and less adapted to run together. When the dry weather of March, April, and May comes, the surface of the land is covered by a fine mould, so that there is no tendency to crack; the amount of evaporation is, therefore, by such means greatly reduced, while less heat is thus carried off, so that it absorbs a greater amount of heat, thereby becoming more favourable to vegetation. It not only gives off less water by evaporation, but it also absorbs more moisture from the atmosphere, and retains more when a summer shower falls. In short, its hygrometrical, thermometrical, and manurial economy is greatly improved, the obdurate, tenacious, clayey subsoil becoming eventually, in a few seasons, changed into a rich black clayey loam, full of vegetable matter.

How different is the case of the field that has neither been artificially drained nor subsoiled! During the drought of summer it is more dry than the other, and hence more effectually drained; but the method of drainage is that of evaporation, which also carries off the heat of the sun. During the winter season, when once thoroughly soaked, it retains less of every subsequent shower that falls, and hence more water is drained off it than off the other field unless during long continued periods of wet weather, when both have absorbed and retain a maximum amount of water; so that the drainage water would under such conditions be equal; but the rain water in the one case flows upon the surface, thus consolidating more and more the land; while it percolates through the soil and subsoil in the other, thereby rendering it more and more porous every season, and more fertile. Just the reverse of this is the natural condition of the undrained field; for it requires every now and then a summer fallow; otherwise it becomes "sour to surface," and thus affords food only for plants that naturally prefer such conditions of the land.

THE MANAGEMENT OF FLAX.

At the monthly meeting of the North-East Agricultural Association of Ireland, recently held in Belfast,

The SECRETARY read a letter which he had received from Mr. Robert H. Dolling, J.P., of Manor House, Killea, drawing attention to the unsatisfactory position in which both buyers and sellers of flax were placed, in consequence of the differences of opinion entertained as to the construction to be put upon the Act passed in the session of 1862, and the consequent disputed claim of buyers to the deduction of a halfpenny or penny per stone, under the name of "storage." The Act of last year, Mr. Dolling stated, contemplated doing away with all changes, and rendering it obligatory upon the buyer to pay in full, without any deduction. He thought it most desirable "that the exact state of the law should be generally known. If the buyer be entitled, let him have the deduction; if not, let there be one general rule in all markets." Mr. Dolling suggested, in conclusion, that the committee should take steps to have all doubt as to the construction to be put upon the law cleared up.

After some discussion, the subject was referred to the Flax Committee.

The Chairman, Mr. BORTHWICK, intimated that the Rev. Joseph Bradshaw, a member of the Special Committee appointed by the Association for Promoting the Growth of Flax in Ireland, had kindly undertaken to read a paper on the management of that crop; and he was sure that the intimate practical knowledge which Mr. Bradshaw was known to possess with regard to the subject he had taken in hand was of itself sufficient to command the attention of his hearers. He then called upon Mr. Bradshaw to proceed.

Mr. BRADSHAW, who was warmly applauded, then read as follows: "At the request of some members of the Com-

mittee, I have undertaken to read a paper on the management of flax, the cultivation of which is at present attracting considerable attention. Three unfavourable harvests, combined with very low prices for grain, happening at a time when there is a brisk and increasing demand for flax, at remunerative prices, have caused many landowners and farmers to seek for information on the management of this valuable crop. Your committee, ever anxious to favour any movement calculated to benefit the agricultural classes, while it answers the no less valuable purpose of supplying our manufacturers with a supply of the raw material, hope to be able, in some measure at least, to meet this want. Trusting that my efforts in this direction may not be altogether without some fruits, may I ask your attention to the following observations, which will be confined, on the present occasion, to the *steeping of flax*? It might be thought by some that it would be better to begin at the beginning. Time enough to steep the flax when it is grown. Now this is one of the mistakes not by any means uncommon with beginners, and to which I must refer at the outset. Many never think of the flax-pool until the flax is ready for pulling, when it may be too late to remedy such a want of foresight. The winter season, when other work is not pressing, is the right time to make provision. All, therefore, who contemplate cultivating flax next year for the first time, or who are not satisfied with their experience of former years, should at once, without delay, set about selecting a proper situation for the steep-hole or pool. Situation is very important, much more so than many experienced persons are aware of. It should be chosen with a view to warmth and a command of water; all other considerations should be looked upon as of little importance compared with these, for on a warm well-

sheltered pool, with the power of turning on and off as much water as you may require, will depend in great measure the quality and yield of the fibre, and as a consequence the success of your whole undertaking. I have known instances where a few yards, and even feet, have caused a material difference in the watering. To many this difference seems wholly inexplicable, and the only account they can give of the matter is that it is so, that it is most singular, and beyond their comprehension. A little patient investigation would, I believe, solve the difficulty; for although I have seen or heard of this curious phenomenon, yet after inquiry and observation I have in most cases been able to assign an adequate cause. In so many instances have I been able to do so that I doubt not any one capable of undertaking the task by patient investigation, chemical investigation if need be, and minute observation, would easily be able to account for them all. One man told me he had part of his flax eight days longer in the water than the other, and yet it was not nearly so well done as the latter, and whilst there were only eighteen inches between the two pools. On inquiry I found the one was a deep ditch, always full of clear spring water, whilst the other was of the ordinary depth, and filled with soft water. Another instance I knew of, where the owner said he had lost one part of his flax, meaning that it had not watered properly, and was, consequently, much injured by steeping it in a hole where four under-drains discharged their contents into it. He was not at all aware until sad experience taught him that effects so serious could be the result of what he deemed so trifling a cause. Many more instances of a similar kind have come under my notice wherein the variation was not so great, and in which a closer examination was required to find out the cause—in one the shadow of some trees, cast over the surface for a short period of the day, was found to retard fermentation in the month of September, whilst in the second week of August, when the weather was very warm, and the sun high, there was no difference between the lengths of time of the flax doing in this pool and the one immediately adjoining. You must not conclude, however that the mere contiguity of trees is injurious: it is only so when they form a shade; for one pool I have is protected from the north by a high bank and a row of lofty beeches, and experience now proves the situation to be a favourable one. Convinced then of the importance of situation, be careful to select the best, and do not hesitate about expense, provided it be judiciously laid out; for it is a most reprehensible economy, a charge to which many farmers, I fear, are liable, to run the risk of losing scores of pounds to save the cost amounting, perhaps, to not more than some ten or twenty shillings in making a proper pool. An old ditch, especially if the ditch back or dyke be to the north, may be the best; but, should the richest land you have be the best situation, do not hesitate to take it: the flax will do more than pay for the difference. If you can have access to both sides for loaded carts, you might make the pool from fourteen to sixteen feet wide: but if only one side is available, from eight to ten feet will be found to be convenient widths. The sides should be a little sloped to guard against their slipping in when the weight comes upon them, for which reason it is advisable not to cart *along* the edge, provided you can conveniently avoid it. The action of the frost also during the winter season occasionally causes great annoyance in this way, especially in clay soils and new-made pools; but by keeping them always full of water, the sides will be effectually protected. Yet, with all the precaution that may be used, it will be found that the sides will require to be trimmed and pared afresh to make them even, thus widening the pool every time this operation is performed; consequently, it will be best to make it of the narrowest width at first. The proper depth is about four feet on level ground; but, should it be on a considerable incline, it may vary from four and a-half feet at the lowest end to three feet at the upper. The land on each side should be thorough drained, running the drains as near to the sides as prudence may dictate, taking care, however, that neither the water from the drains can get into the pool, nor the reverse. If the soil be very porous it may be found necessary to take means of guarding against escape, which will best be done by cutting a deep and narrow trench parallel to the sides, and some three or four feet from them, running the whole length, only turning it into the side at each place where you put a weir or a dyke across, so that each pool may be water-tight; and then ram this trench

with clay. Care should be taken not to make this trench so near to the side of the pool as to cause any danger of shoving it in when ramming down the clay. No pool should be larger than can be filled in the same day, for it must not be forgotten that the flax first put in is last taken out. By placing a few stakes across, and ramming in sods and clay above them, a dam or weir can be formed at any required point. The pools being finished and made complete, which ought to be six months before harvest, I have now to draw your attention to the ordinary methods usually adopted in handling the flax. In most cases the pool is allowed to be filled with water to the required height—about three and-a-half or four feet; the flax is then put in, beginning at the lower end, or where the water is deepest, in regular rows across the drains, with the root end down, resting on the bottom and standing nearly upright, so that when filled it presents the appearance of a dense crop with the seed bolls just over the surface of the water. To do this properly requires a little care and dexterity. If it is filled from both sides two loads should be emptied down, one at each side, and then a man at each side should begin at the same time by taking a beet, as a sheaf of green flax is provincially called, and casting it into the middle lengthwise; the next one close to it, and in exactly the same position, and so on to the edge at his feet, where he ought to crush the last one rather tighter, and occasionally put an additional one in on the flat, or indeed regularly the whole length of the pool, to compensate for the divergence of the sides, and so have it all of a uniform tightness. Great inconvenience frequently arises from want of attention to this; for, when the flax begins to ferment, it casts the sods or stones placed on it to the slack part, where they find their way to the bottom. For this reason also I prefer putting the flax pretty tight all through. It economises space, too. In the revised instructions published by your society, we give the opposite advice, recommending it to be placed in loosely. After close observation, I cannot find any perceptible difference in the doing of the flax, whether loosely or compactly put in; and, as the inconvenience I have just noticed attends the former, I decidedly advise the putting it in tightly and compactly. Should the pool be filled from the one side only, the same method is adopted, with this difference, that the first beet of each row is pitched across to the opposite side, and afterwards the man goes round and packs in a beet or two up the side wherever required. Another method, when you have a reservoir or pond at command, is put the flax in before the water, which is certainly a good plan, as it can be done with great regularity. One man stands in the drain, and has the beets handed to him, which he places in the way pointed out, root end down, in regular and compact rows across. When the pool is deeper at the low end than at the top, care must be taken to slope the flax gradually more and more towards the shallow end, so as to have the tops of the beets level, and of a uniform depth below the surface of the water. When it is put in dry the weights should be placed over it before the water is let in. The whole should be covered with sods or stones, equalising the weight as nearly as possible all over. If sods be used, the green side should be placed next the flax; but the inconvenience and expense of procuring these every season, especially where there is a large quantity of flax grown, induce most farmers to prefer stones instead, as the stones can easily be built up and kept for future use. If the weather be warm and the water favourable, fermentation will set in immediately, and the sooner the better. About the second or third day it will begin to work and swell up, and the more it does so the more favourable are the indications of it going on well. Care, however, must be taken to keep it down below the surface of the water; let none of it appear above; and, if trampling or pushing it down with a bare foot or the T end of a spade shaft be not sufficient, additional stones must be placed on; and, should even this fail, you must let in additional water. There should always be about two inches of water over the surface. In some five or six days, or two days after the fermentation has reached its height, it begins to subside, and the flax to fall down to the bottom. Care should now be taken to let water off, and, if need be, to take some of the weight off also, as it is not desirable to have it pressed down too much when settling into the decomposed state. A small stream, say about the thickness of a man's wrist, passing through the pool

carries off the dark fetid water, and is considered to improve the quality and colour of the flax. Now comes the critical period to decide when it is watered enough—exactly enough—neither overdose nor underdone. And here I may remark that at times the most experienced and skilful hands are at fault; so much is this the case that you seldom meet a flax-grower, however experienced, that will not confess to you he has been at times too hasty or too tardy in this respect. But, vishal, I am of opinion that, by bringing intelligence and experience to our aid, we need seldom err in deciding upon the proper period when it should be taken out of the steep-pool. As a wise physician will take care to gain all the information he can from the patient or his friends before he draws conclusions about the symptoms of the disease and the remedies to be adopted, so a prudent farmer will take a great many things into consideration before deciding upon the indications of the one great test—whether, for example, the flax, grew well and is a good sample of a healthy, strong fibre; whether the weather is very warm, the steep-pool favourably situated, filled with nice soft water, free from all deleterious matter such as lime, iron, or lead ore; whether fermentation set in immediately, and worked well and violently, and then as quickly and quietly subsided. And, if he knows that all these things have occurred, he concludes that he ought to be very watchful. He examines on the seventh, or, at the farthest, on the eighth day, in the following manner:—Having removed some sods or stones, as the case may be, about the middle of the pool—middle as regards both ends and sides—he pulls up a beet as gently as possible, and places it on the edge, and, in doing so, notices whether the seed bolls drop off freely; he then gives it a good shake at the end, and, if all the seed drops off completely, he concludes this to be one favourable sign. He next grasps as much as he can hold firmly in his hand, and, if it feels soft, clammy, and compliant, and does not separate when he opens his hand, but, on the contrary, that it sticks well together as if half-glued, requiring a little force to separate the stalks, he concludes this to be another favourable symptom, and then proceeds to the final and important test by taking some six or eight stems out of the centre of the beet, and bending them rather sharply over his forefinger, holding the end firmly with his thumb; if the stem breaks under this operation, and the above or inside part starts out like a broken bone, he concludes that the flax is done. It will almost invariably be found that in applying this last test the stem will be brittle at the root end first, and get less and less so as you approach the seed end. It is best, therefore, to begin at the root and proceed upwards, and, if you still find it brittle to the middle of the stem, you may be sure it is done. I need scarcely say that the opposite or a modification of all or any of these indications or tests would point out that the time had not arrived for taking it out. It should be examined morning and evening until found ready. From eight to twelve days is the usual time. I have never had any under eight, and seldom more than twelve days in the steep. It sometimes happens that it makes no progress after coming up to a certain point. You examine it day after day: it is not done, nor can you perceive the slightest change though it remains sixteen or eighteen days in the water. It is one of those seemingly inexplicable cases to which I have already referred. I have never found, however, that cases of this kind occur at the beginning of the season, or when the weather is warm, but only when it happens to be late in the season, or when the atmosphere turns suddenly cold and chilly. All the flax, for example, this year watered in the month of August when the weather was warm went on regularly and well; whilst the cold chilly nights of September had the most injurious effect by at once checking fermentation. In a case of this kind there seems no help for it but to take it out in fourteen or fifteen days half-done as it is, and trust to the grazing for finishing it. We ought to learn, however, from such examples not to be late in the season, lest we lose our whole crop. I ought to mention that many farmers are in the habit of taking the stones or sods off, and allowing the flax to float for twenty-four hours before taking it out, as this seems to hasten it at the last. I have no doubt the theory is correct and the practice a good one, but should never be practised by any except those sufficiently experienced to know when the flax is all but done. In taking the flax out run off about half of the water, then remove the weights and proceed to throw the beets on the edge, on one or both sides. There can be no doubt that to

pitch it out with the hands is best, but I do not object to men using a crooked fork or drag and pulling it out. An ordinary hay-fork with the toes turned will answer the purpose, only the toes should not be very sharp lest they cut the fibre. With this instrument the man draws the beets to him, placing a toe on each side of the band, and so hauls them on the edge, where another man builds them in a regular heap on their flat, ready to be carted to the spread-ground. Some allow it to remain twelve or twenty-four hours in the heap; but the sooner it is spread the better, as the wetness contributes much to the ease of this operation."

Mr. CHARLEY expressed the great gratification that he felt in being present at the reading of so valuable a treatise as that which they had just heard. The great evil hitherto was in theorising too much; but that was a fault which did not exist in the paper which had just been read, for Mr. Bradshaw's observations were exceedingly practical and accurate—so much so, that he (Mr. Charley) could scarcely take exception to any of them. It was undeniable that the prosperity of the linen trade was most beneficial to the farmer; but as he was himself identified with that trade, he would exclude it from his observations, as he always preferred appearing at those meetings in the character of an agriculturist. To do justice at one meeting, or in one paper, to the entire subject of flax treatment in all its stages, was an absolute impossibility, it being one of such extent that any one speaker familiar with it could occupy a much longer time in the delivery of his observations than any assemblage could be expected to have patience to listen to, or available time to wait for, whilst the next would probably find ample material left to occupy him for hours. He, therefore, highly approved of taking up the subject in separate stages, and in successive papers. Mr. Charley then adduced several instances which had come under his own observation, and which practically bore out the theories advanced in Mr. Bradshaw's paper. He also laid particular emphasis on the passage which urged the necessity of preparing the flax steeping holes in time, and condemned the practice of steeping in running streams, which was highly inconvenient and injurious, not only to the inhabitants of the locality who used the water for culinary purposes, but also to the cattle, and in some instances even to the trade of the district in which this reprehensible practice was carried on. If this latter system was an unavoidable evil, he would submit to it without a murmur; but, as he knew that it could be avoided by a little care, and at a very small expense, he thought it only reasonable to call on such farmers as those remarks applied to, to have their flax-holes better arranged for the future.

Mr. PHILIPS observed that, with regard to the estimated time for steeping, he found that his flax was this year over-steeped in six days.

On the motion of Mr. CHARLEY, seconded by Mr. WILSON, a vote of thanks was passed to Mr. Bradshaw, for his kindness in preparing and reading his valuable paper.

The CHAIRMAN, in conveying the thanks of the meeting, said that he spoke the sentiments of the committee in requesting Mr. Bradshaw to favour them with another paper on a future occasion.

Mr. BRADSHAW expressed his willingness to do so.

The CHAIRMAN intimated that Mr. Charley had promised to read a paper either on flax or some other agricultural subject. He expressed the hope that the practice now introduced would be the inauguration of a regular succession of valuable papers on various subjects.

THE HONOURABLE MR. MELVILLE ON LINCOLN SHEEP.—At the annual meeting of the Lincoln Farmers' Club, the Hon. A. L. Melville said: With respect to the class for whose encouragement these societies were intended, he did not hesitate to say that there were as good labourers in Lincolnshire as were to be met with in any county; indeed, he did not know where one could find labourers equal to them. Now, he did not say this to flatter Lincolnshire farmers, for he was more apt to tell them their faults. Whenever he saw anything that he thought better done in another county he did not scruple to tell them of it. Mr. Marshall had heard him talk of Scotch turnips, and scarcely believed him, until he had gone to Scotland himself, and he now admitted that he was really surprised by what he saw. No doubt, climate had

a great deal to do with it, but at any rate they had vastly improved their turnip crops in Lincolnshire during the last twenty years. On the other hand, the large farmers on Mr. Nesbit Hamilton's great estate in Scotland would scarcely credit his accounts of the Lincolnshire sheep. The Scotch farmers still went on growing wheat, potatoes, and swede turnips (which they gave to cattle), and though wool was at 56s., they thought sheep were of next to no consequence! When he (Mr. Melville) went down into Scotland, he told the farmers there that wheat and other produce having fallen a third in value, and sheep and wool risen a third in value, it ought to be obvious to every prudent man that he should produce as much wool and mutton as possible. Well, his friend, Mr. Hamilton, it appeared, was impressed with this, and one of his tenants got some Cotswolds—wonderful sheep when fed up for show, but nothing in comparison with Lincoln sheep as rent-paying animals. The latter would not bear the feeding or show the perfection of the Cotswolds. He believed, however, that there was nothing in the way of sheep to be seen anywhere which equalled the 30,000 year-old sheep shown at Lincoln April fair. He had often wondered what became of all the sheep sold at that fair, and sold, too, for such high prices, and it was not often he had the opportunity of tracing their destination. He had, however, a young friend—a gentleman's son—who had a farm on the Trent side, and who bought 300 hogs at last Lincoln fair at 65s. a-piece. He (Mr. Melville) asked him if he saw his way to making a profit out of such a large investment. His young friend replied, "I did the same thing last year at nearly the same price, and when I came to clip the sheep, I found a good number of them toded two, and there was a good number toded three.

Now, if I give 65s. for a sheep, and I clip 25s. off his back, I have a good fat sheep remaining; and, having tried different things, I find that no one thing has answered me so well in grazing as the hogs I buy at your Lincoln fair." This was the experience of merely a beginner. When he (Mr. Melville) talked to them in Scotland of the Lincoln sheep, and the price they fetched, they stared and told him he was talking nonsense. Then he said to them, "Only come to Lincoln fair, and I'll show you plenty of sheep that you shan't have if you won't give 65s. a-head." Well one man had written to a Scotch paper to say that he came over here to Wragby fair, and bought some sheep, and took them home, and his speculation was a complete failure; they got so fat that they did not lamb, and the few lambs that were born were a degenerate lot and good for nothing, and he advised all his neighbours to have nothing to do with this "excellent breed of sheep." The fact was that the Scotch would not believe that the Lincolnshire sheep would live upon nothing. They thought that they must pamper them as they were obliged to do their own breeds. Lincolnshire ewes would not breed on fall diet. When they saw the sheep here, they exclaimed, "They have nothing to eat." They had certainly very little to eat this last season, and an Irishman made the remark to him that there was more pasture on their roads than in their fields, which was literally a fact. Well, Lincolnshire sheep were sheep that would feed upon nothing, and that was the sort of sheep for farmers. He was speaking, of course, of ewes; and he repeated that the Lincoln ewes would feed upon less than any other kind of sheep. It was, therefore, no doubt the high feeding which was the cause of the disappointment experienced by the Scotch farmer who bought sheep at Wragby fair.

OUR COLONIES FOR ABLE-BODIED PAUPERS.

"Idle horses soon eat off their own heads," it is said; and the maxim is equally applicable to our idle and able-bodied paupers. If, therefore, we cannot sell our surplus agricultural labourers, as we do our spare horses, so as to avoid such a penalty, we can well afford to give them a free passage to Canada, the Cape, or Australia, and be the greater of the two gainers by the transaction; for what will keep an idle man and his family in the Union for twelve months, would send them across the Atlantic with friendly faces and flying colours, leaving ratepayers a respectable balance at their bankers', with few or no old, worn-out paupers to provide for.

The problem only requires to be seen at both ends, to be practically understood and solved. With a properly-organized system of emigration and settlement in our colonies, able-bodied, idle agricultural labourers, in search of employment at two shillings per day, would cease to be an anomaly in the mother-country; for if they could get a dollar for the same quantity of labour in the colony, the result need hardly be told. Were it broadcloth, or any manufactured fabric, or other article of commerce, save the poor man's labour, we should soon hear of a Company (limited), holding out cent. per cent. to shareholders, with a flattering bonus at the tail of the speculation annually. With a loss of cent. per cent. at home, and a gain of two hundred per cent. on the other side of the Atlantic, there is, at least, a wide field open for enterprise and speculation.

Can anything be done to organize a system, so as to make money out of it? In a question of this kind, we know nothing about philanthropy or any other thing, save a remunerating balance every quarter-day. And, with a commodity that requires two shillings per day to keep it at home, and which would fetch a company four shillings per day in a colony, there is a difference of six shillings; so that the conclusion forces itself upon us, that it don't require any philanthropy at all to make out, prospectively, a fair balance-sheet both for the mother-country and her colony.

It may be advisable to reply to an objection which may be raised to the practicability of the proposition, before going further. It may be said, for example, that we have plenty of Colonial Land Schemes already in operation, but that they neither pay sufficiently remunerating interest on capital, nor mitigate in the slightest degree the evils of the broken-time-

system complained of, one that has proved itself more than ordinarily fertile of pauperism.

The objection, it will be seen, falls to the ground on the plea of suicide, the latter part destroying the former. Our proposition is a Colonial Land Scheme having for its object the settlement of our able-bodied, idle labourers in our colonies, so as to find remunerating employment for them, and at the same time to relieve us of poor-rates in supporting them when they get old and infirm as paupers at home. If this can be done there would be derived from the difference of six shillings per day during the prime of life what would pay remunerating interest on the capital required to carry out the project into active and successful operation. And to this difference must be added the profits arising from colonial agriculture more skillfully and successfully carried out into practice than under the present system. Thus, what will a day's labour produce in the cultivation of land in a colony, when applied through the instrumentality of the most approved cottage economy, manures, implements, and machinery which the mother-country and her colony can jointly supply? The successful working of the proposition is, therefore, based upon the economy of agricultural labour, both home and colonial. Our present Land Schemes are, with hardly an exception to the contrary, mere pecuniary speculations in the transfer of land. Thus a Company purchases a large tract of colonial land, at a few shillings per acre, and sells it at twice, three, or it may be four times the money. Hence its penny wise and pound foolish profit! But those who know anything practically about successful agriculture, and the economy of labour and machinery applied to the cultivation of land, could never dream of relief to our pauper system at home, or a high degree of prosperity to our colonies, under such a catch-penny speculation in land? In point of fact, it would be difficult to devise a more pauperising system than this same intermediate land-jobbing; for, at home, as in Ireland, it has proved itself to be a curse to all connected with it; and also in all countries where the principle of intermediate jobbing in land has been acted upon. To offer proof in support of this conclusion in the case in question would be superfluous, for if a Company buys land at 5s. per acre and sells it at 25s., then the 20s. of difference thus extorted by the intermediate land-jobber hangs upon the neck of the

purchaser like a millstone, which no colonial farmer is able to carry, in the up-hill race of competition which every settler in the outset has to experience.

To be relieved of able-bodied paupers at home in accordance with our proposition involves a more propitious state of industry for the whole of our labouring population at home, and also a more prosperous state of agriculture and industry in general in our colonies. It involves not only better paid-labour at home, but also better-paid labour in the colonies, with more machinery and steam-power to economize manual labour. It is the very reverse of lower wages in the mother-country and a millstone about the neck of the colonist when he squats himself to rough it in the bush! In the former case, for example, the daily wages of the agricultural labourer at home might not be much increased, but his employment would be more uniform and regular, his cottage accommodation superior, and his outgoings somewhat less than they now are; so that his condition, upon the whole, would be morally, physically, and socially advanced. In the latter case again, the settler would be free, comparatively speaking, from the hardships now experienced in the bush from the want of the necessary mechanical means involved in the most economical application of labour to land, and in the most profitable commerce of its produce, both natural and artificial. The American war has taught us one practical lesson, which will not soon be forgotten, viz., too exclusive a dependence upon American cotton, to the neglect of cultivating the resources of our own colonies and Indian empire—a dependence which may not inaptly be termed a purely mercantile relation, on the catch-penny principle. Now, it is not a commercial relation of this kind with her colonies that England requires at the present time; but one based upon a more permanent and scientific foundation. We want, for example, a fruitful field of employment for our growing surplus population, and all the produce of their labour which they can spare us in return. The wants of the mother-country and her colonies are those of a reciprocating character, if their respective industrial and social circumstances are economically managed. The boundless territory of the latter requires, not only labour to reclaim it from its natural wildness, but that labour properly subdivided through the instrumentality of machinery, steam, and other motive power that can be brought into the field as an auxiliary to the manual labour of the settlers. In short, our colonies ought to form a more inviting field than the mother-country, not only for our pauper labourers, but also for the younger sons and daughters of landowners, farmers, &c., &c., a large number of whom are likewise, not only idle encumberers of the ground, but also a heavier burden in many instances upon their parents than the former, the labourers who are supported by poor rates. Hitherto our extensive colonial empire has been looked down upon by landowners, farmers, and the better classes of artisans, as lying at a lower level in the world than the mother-country, with all the heavy taxes she has to pay; but such a state of things, granting the above conclusion to be true as to the imaginary low level of the colonies, cannot be justified either on practical or scientific grounds, but the contrary, so that for the future their industrial resources ought to be elevated to their normal and legitimate level.

The relation that ought to exist between the mother-country and her colony is thus a social and industrial one. This is manifest from the last and preceding paragraphs. To those who look upon money as the representative of everything, the proposition as it now stands may be objected to as amounting to something like "paint and varnish." But this objection is already virtually overruled; for our colonies have of late years been rapidly rising in the estimation of the general public; so that if they are not by this time ahead of the mother-country as an investment for landowners' and tenants' capital, skill, and labour, they are not far behind, under a properly-organized system of emigration, settlement, and agriculture. True enough, a vast amount of idleness, profligacy, and pauperism still exists in the mother-country, wedded with no small degree of prejudice against leaving her overburdened and crowded firesides and family associations, in exchange for the many hardships that continue to be experienced in our colonies by those whom misfortune has compelled to bid family ties and fatherland an endless farewell. But as this is the very state of things complained of, for which our proposition is intended to make provision, it would consequently

be many degrees worse than absurd to advance it as the rule, since it is by hypothesis the antiquated and even condemned exception, the very opposite of the practical state of things sought in terms of the proposition.

It follows from the last paragraph that the shareholders of any company, or the members of any system organized for carrying out the proposition into practice, consist of the emigrants or colonists themselves, and their relatives at home. It is a family affair between the mother-country and her colonies, and as such its whole working details should be faithfully carried out into practice according to the most advanced state of science. Improper household accommodation, implements, machinery, animate and inanimate power, are just as disastrous to colonial agriculture as they are to farming in this country. Between such antiquated and improper means and the adverse (viz., the most improved household accommodation, implements, machinery, steam power, and other mechanical and chemical appliances), there is hardly a comparison to be drawn; for the former (the bad), is that which lowers at present, in the majority of cases, the general standard of colonial agriculture; while the latter (the good) would place the colonist on a level with the best farmers at home. In other words, the mother-country and her colony should stand upon a footing of equality in every respect, with the exception of the labour of reclaiming the land when heavily covered with wood, which under proper management ought to be in favour of the colony, and not against it, as some pseudo-agricultural and political economists have hastily concluded; for it furnishes a source of employment for labourers and artisans, and of timber for building and other purposes, and for exportation. A colony, therefore, such as Canada, for example, requires a larger proportion of labourers and artisans in connection with the "lumber and building trades" than purchasers of land, and those exclusively engaged in the purely agricultural pursuits after the land is reclaimed, and in the manufacture and commerce of its produce; and such a demand is exactly that which suits the supply of the mother-country. It may therefore be taken as a practical exemplification of the character of the family, and of the family relation that requires to be established in a colony like North America. The latitude of the West Indies, Cape, East Indies, and Australia being each different from that of the mother-country, their respective systems of agriculture would be different, but in other respects the relation would be similar. In short, the problem is to plant our surplus population in the vast colonial empire in the highest degree of prosperity from the outset, and both the parent stock and the young colonists are required to pull together in its practical solution.

The bulky details of our subject will not permit of a very minute and lengthened examination. If we take Canada as the field of labour, the first work is to purchase, at as low a figure as possible, the land; the second is to fell the timber; the third, to build the homestead and cottages; fourth, the cultivation of the cleared land; then follows seed time and harvest; the balance-sheet and the profits, with the summing up or concluding question, *Will it pay?*

The practical answer to this important practical finale hinges, of course, upon the professional skill and industry of the colonists. We are prepared to quote numerous examples in which individual enterprise is highly successful; and the general prosperity of Canada must be taken as furnishing similar evidence. This is more especially the case when the disadvantages now experienced by the vast majority of settlers are taken into consideration, for if the hardships and roughness thus referred to can be done away with under an improved system, then it is manifest that a higher degree of general prosperity and progress would be exemplified.

Turning to the mother-country, we have lastly, in conclusion, to review our surplus population roll, of farmers, agricultural labourers, carpenters, masons, &c., &c., now on the look-out for farms, employment, &c., &c., but who cannot find at home what they require, in order to ascertain if they possess the requisite amount of skill and industry to make the project pay? Taking them in the gross, we are somewhat afraid to pronounce a very elevated opinion in their favour: at the same time it may safely be said that chosen hands could be selected who would show a remunerating balance-sheet at the close of the year; and that the less talented workman could fight their way upwards from being "hewers of timber," &c., to small

estates. There is not a county in the kingdom which could not furnish its quota of young farmers and artisans, who would make successful colonists under a properly organized system, but for whom there is no open field at home, and who

would thus take with them our able-bodied paupers. A successfully working system would also tend greatly to improve the moral and industrial character of the labourers left behind in the mother-country.

W. B.

RETENTION OF MOISTURE IN TURNIP LANDS.

Moisture is a very essential element of life-producing fertility by its presence in soils, and sterility by its absence. Properly-constituted soils in the terrestrial matter, with a due proportion of the decomposed remains of animals and vegetables, imbibe and retain an equable quantity of moisture, which is administered to the growing vegetation in a degree that very prosperously advances the healthy condition. The absence of moisture causes a languishing decay of plants, by reason of the want of the essential vehicle of nutriment, which does not remain in the soil, from the porous nature of its constitution, in the absence of the agglutinated contact of the particles. Moisture being lost by want of cohesion in the soil, heat penetrates, the distant particles are warmed, the roots of plants are shrivelled and scorched, and vegetation is checked and decays. This result happens on all dry lands, in a greater or lesser degree, according to the constitution—earths, sands, and chalks differing only in the ratio, not in the mode or manner. These light loose soils being turnip lands, or fitted to the growth of that esculent, and moisture being a most essential food to young and tender vegetation, as milk to the child, the presence of it in the soil for the use of the turnip seedlings, in the driest season of the year, becomes the most important point in turnip farming. Soils naturally loose, porous, and dry, being placed under an arid climate, the obligation is vastly increased of retaining moisture in the lands that are sown with turnips, as on its presence the crop very much depends, as is known to all green-crop farmers.

The exposure of soils, during the driest period of the summer season, causes the evaporation of moisture, which is exhausted by the rays of the sun, and vanishes into a thin air. A continuation of dry weather exhausts the quantity of moisture in the soil, or during that time the working of the land is in progress in being ploughed, harrowed, and rolled, and consequently exposed to the action of drought, the upper soil becomes a dry pulverisation that is wholly devoid of moisture, and in the not infrequent case of a portion of clay in the composition of the soil, the surface ground is rendered, by the repeated exposures by ploughing, a collection of small dried clods, which pass untouched between the times of the harrows, and are pressed into the ground by the roll without being crushed, and are therefore incapable of any further reduction. In both cases of exsiccation, the surface is wholly devoid of moisture—being an arid pulverisation and a mass of small dried clods. Turnip seeds being sown among these preparations, either in drills or on the flat ground, vegetate thinly and languidly, or never at all, and seldom rise into prosperity.

This dryness of soil and aridity of climate prevails over South Britain, or the southern half of England, whilst the soil and atmosphere being naturally unfavourable to the growth of turnips, the cultivation of that plant becomes a point of much interest and anxiety. Over the whole of Scotland, and the north of England, a uniform and very successful system prevails, by reason of the favourable soils and climates that are enjoyed. The soils of Scotland are mostly alluvial earths, lying upon primitive formations, in many cases forming the true loams of viscous earths, clammy and cohesive, but easily separated and reduced, and again cohering in a state of rest, to imbibe and retain the necessary moisture and calorific. These loams rest upon the sandstones, the uppermost deposit of that country, and have enjoyed a commixture of lime, which lies upon the carboniferous base. The quality of the soils is very good; and being assisted by the frequent rains and dews of the country, renders the success of growing turnips almost certain. Where the soils are removed from any mixture with limes, and are merely loose earths, the climate of frequent

rains and dews secures an equal success in turnip farming. In the north and west of England the same circumstances prevail.

The mode of growing turnips in North Britain is well known to consist in repeated workings of the land by ploughing, harrowing, and rolling, until the soil is reduced to a sufficient fineness and has been cleaned of all weeds and stones. When the season has arrived for sowing turnips, the land is raised by the plough into ridglets, which are split and reversed over the dung that is spread in the intervals of the drills. The two drillings expose the land to evaporation, which, even in these favourable circumstances, is guarded against as much as possible by the work being done so quickly as not more than half-an-hour elapses from the ground being moved by the plough into a ridglet, the dung laid or spread in the intervals, the drills reversed over the dung, and the turnip-seed sown in the fresh tilth of soil, and also that 10 or 14 days intervene between the workings. This process requires the combined force of extensive farms of 400 acres and upwards. Smaller farms expose the soil for a longer time. The exsiccation of the soil by the two drillings has been partially remedied by sowing the turnip seed on the flat surface by means of lengthened coulter that make a rut in the ground to receive the seed. This mode removes the exsiccation of two drillings, but incurs the objection of depositing the seed in a parched dust on the surface after the land has been exposed during the working. It remains to adopt a process by which the upturning to drought of the land by the plough is removed, and the consequent evaporation of moisture prevented, along with the not forming the land into ridglets by being twice drilled.

In the usual time of ploughing stubbles after harvest and in the early winter, the land must be ploughed in a deep round square furrow of 7 or 8 inches, by the power of three or four horses, if necessary. This depth is required, to afford soil for the subsequent operations of cultivation. In the spring, when the dry season allows the stirring of winter fallows, Finlayson's harrow, with the power of four horses, is driven across the field, if the soil be of the truly light nature; if any way stiff and waxy the first working may be lengthwise, as it will easier break the texture for the second application, which will be done right across. The land, being thus once moved if light, and twice if stiffer, is to be harrowed, rolled, and harrowed in the usual way, the weeds picked by hand, and removed with all stones from the ground. In this level condition, that has not been turned up to exposure, the land lies from April to May, when it is again moved, by the power of two horses, across the direction of the last application. The ground is harrowed, rolled, and harrowed, when the weeds are picked and removed. The third working (in June), done in the same way, generally prepares the ground for being manured and sown; if not, the process is repeated.

The land having been deeply ploughed, the tines of the grubber penetrate the depth, move and stir the ground, which is not turned up, as by the plough, to exposure, and the round tines drag the weeds to the surface without cutting the lengths, as is done by the coulter and shares of the cross-ploughings. The work is much reduced in the expense, as four horses in the harrow will grub eight to ten acres daily in the first working, and two horses will go over six to eight acres in the subsequent operations. The inestimable advantage is in the land not being turned up to exposure; not only is the winter's moisture retained, but more is contracted by the land lying in a flat condition between the stirrings for a time, that exceeds fourfold the intervals between the common ploughings. The stirrings by the grubber are to be applied in frequency and number as seem to be required.

The moisture having been preserved during the preparation of the land, it must be as carefully retained in the process of manuring the ground and sowing the seed. In the case of using artificial manures, the ground is to be ridged by one furrow of the common plough at 26 or 28 inches distant. Two ploughs will drill 8 to 10 acres in a day; and Hornsby's drop-drill will sow the same quantity of ground with seed and manure in mixture, the coulters splitting deeply the new-made drills in a mass of fresh tilth, in which the seed is deposited, and immediately pressed closely over by a roll of moderate weight. These processes are done in a close succession, begun in the morning and finished every night, and the land is exposed during the very short time which the plough and drop-drill require to walk over the ground. It is a quick process, and must be quickly done, in order to retain the moisture. It surpasses sowing on the flat ground, and deposits the seed in fresh tilth; and in the other way it is placed among the parched dust on the top of the ground. The advantage of fresh tilth is worth much more than the labour that is incurred by drilling.

When farm-yard dung is used as manure, it is spread on the fine surface of the prepared ground, and ploughed under with one furrow. The surface being lightly harrowed, the turnip-seed is sown in rows, by a machine with long coulters to make rats in the ground, or by the corn drill with sowing-cups at the required distances. A bush-harrowing or a rolling covers the seed, and the latter process best excludes the drought, by pressing the ground into a plain surface, but exposes the young seedlings more than the roughness from harrowing, which gives protection in the hollows of the soil. But rolling is to be preferred, and a bush-harrow may follow it. The ridges or divisions of the ploughed land are made in width to suit a certain number of rows in twenty-eight inches distance.

Flat-drilling does not afford so good accommodation to the scuffler as the ridging of the land, where a hollow is presented to its unrestricted action, and in which the weeds are destroyed by the repeated movements, and the soil very finely pulverized. The scuffler does work in flat-drilling, but with a tendency to throw the soil and weeds upon the young plants, and to raise the interval of varied earth higher than the row of turnips, whereas in ridglets the hollows contain the weeds and all the loosened soil. This disadvantage of flat drilling must be endured, in order to secure the benefit of not exposing the soil by two drillings, and evaporating the moisture.

It will be both convenient and advantageous that the straws of the farm that are used as litter be cut by machinery into short lengths, to be strewed in the yards and mixed with the feet of the animals and saturated with urine. Being carried from the yard in the fresh condition and spread over the prepared grounds, one ploughing will cover it, when the turnip seed is sown as above directed in rows on the flat surface slightly harrowed. The cut straws being short, and the fecal matters broken small by the spreading-forks, the ploughed land with the dung may be again wrought with the harrows in order to mix intimately the soil and the dung. This being accomplished by one or two grubbing, the land may be drilled by one furrow of the common plough, as for artificial manures, and the seed sown on the ridglets by the common two-drill sowing-machine, or may be sown on the flat ground as has been described.

The mixing of the dung with the soil will very much assist the retention of moisture in light soils by adding and diffusing the quantity of moisture which it contains, and from both the solid and urinary (scas being mixed with the soil in a very intimate manner. This intimacy of union constitutes a very chief source of fertility in lands,

THE WEATHER.

TO THE EDITOR OF THE TIMES.

SIR,—You have aided practical meteorology so efficiently that I am now induced to ask for your publication of the following memorandum, as a general answer to very numerous observations and questions.

As the public pay for what is effected in our international meteorologic telegraphy, all have a claim to "know the reason why."

Your obedient servant,

London, Dec. 2.

R. FITZROY.

FORECASTS OF WEATHER.

Many persons have asked questions about forecasts of weather and their principles. Some have impugned their accuracy, and a few have demurred to their having any claim to a really scientific basis.

No doubt that as very different views of atmospheric conditions or changes are taken by able men, such subjects may scarcely seem worth their earnest attention, because as yet they have not been brought to the verification of a rigid mathematical analysis.

But to metaphysical inquiries, and to other researches or avocations, indispensably useful, one might take objection, and decline their study on similar grounds. Meteorology not only abounds in physical facts, excessively useful as well as interesting, but it demands an extensive range of intellectual and extremely comprehensive considerations.

One cannot take it into full use without due study; yet who is there without an independent opinion of the weather, and perhaps too little understood barometric indications?

Having ascertained that the principal atmospheric currents are necessarily in more or less circuitous but mutually opposed progress, sometimes side by side but in contrary directions, sometimes superposed, one or other being nearest earth's surface, temporarily, and always having lateral as well as direct progression, we have a clue to their dynamy by observations at distant stations, and by telegraphing to a centre, somewhat like that which might be given in a tidal estuary by ships

swinging in advancing or receding tide streams to an observer at a fixed station.

By the tension or barometric pressure, the temperature and other characteristics of the air at each station—by the approximate knowledge now possessed of the set, turn, or progression of atmospheric currents—of their relative breadth horizontally, and of the circuitous eddies usually, or often, between their edges or boundaries—one may tell what conditions of air exist within some hundred miles around—say, a sweep of 500 miles from London (as a centre), and, which is of far more value, what changes or movements are impending.

The capability of doing this for about two days in advance rests on the proved fact of a general lateral translation towards the east in the Temperate Zone, while northerly, southerly, or other (mixed) currents of air are in very various movement, the practical results on earth's surface being usually composite motions.

By thus estimating the atmospheric area above, around, and within some hundred miles of us; by statical observations at the same hour, and by summary calculations of a dynamic character, all the principal motions and changes are brought within the grasp of forecast.

But this applies only to general and principal averages, not to local peculiarities or special disturbances so limited in nature that they do not affect more than a few score miles' expanse of atmosphere.

It ought to be kept in mind that broad shallow currents are the chief aerial features, below or between or among which there can be no vacancy, unless momentarily, as when a violent blast of wind is caused by a sudden (approximate) vacuum; and that when currents act against each other (gravity restraining upward motion) their tendency is to cause more or less rotation.

The lamented Espy said that winds always set from the place of higher barometer towards that of lower, but he also said (which some writers seem to have overlooked) that the meeting of such winds causes a circuitous effect. Espy's views accord with those of the authoritative Dove and our own illustrious Herschel.

The word cyclone has been associated with storm that few persons attach to it now the simple and ancient sense of circuit or circuitous.

Without duly following the progress and ultimate destination of material fluid air having great bulk, infinite elasticity, and more or less *vis inertia*, or rather momentum, according to mechanical laws, some persons have imagined that air currents intermix, as if unresistingly, instead of opposing each other for a time, especially if in rapid motion, just like the currents of water in a river or in the sea.

Air streams in opposition must deflect or turn each other, or go upwards (against gravitation).

Without a general, lateral, or transmeridional movement, or translation of atmosphere toward the east in the temperate zones, but westward in the intertropical regions, in addition to meridional movements from and toward the poles (of which full explanations are given elsewhere), it would not be possible to forecast the character of wind and weather beyond one day's interval. It is the prescience of dynamic consequences, arising out of statistical facts, that enables a really scientific calculation of probabilities to be made. Certainty is not yet attainable, but a fair average probability, for a certain area or district, is already within our reach. Out of these forecasts spring the cautionary notices of impending storms.

It is by a continuous observation of the changes and indications of change that we are now enabled to decide and direct with confidence.

Without such a generally informed state we should often be surprised, as we should derive our warnings solely from distant stations, and should not be able, as now, frequently to warn even outposts such as Nairn, Valencia, or Rochefort.

That errors have occurred, that we have been too slow, or have given warning where it seemed to have been unnecessary, may appear to have been unavoidable in such new and tentative experiments.

But there have been four special causes of occasional failure, which ought to be fairly considered.

1. A watch having been officially set, to report on the results of each cautionary signal, has somewhat discouraged such speedy action as might otherwise have been taken in signalling, but a record of their inutility should be compiled, rather than the contrary.

2. Public offices are not open on Sundays, and only a few principal telegraph stations are then available. Hence there is sometimes unavoidable delay between Saturday and Monday.

3. No one or two persons can be always at their station all the year round from morning to night. The new subject of forecasting and warning is hardly yet so familiar to many persons, however zealous, as it may be in due time.

Lastly, the telegraph offices are not open in general till 8 or 9 in the morning or after those hours at night; therefore official communications are only practicable over so wide a range as ours between those times of the day.

To communicate between Nairn or Valencia or Rochefort and our offices in London usually takes about two hours in actual practice.

For proofs of what has been thus stated, perhaps too dogmatically, about the movement of air currents and their lateral translation, I would suggest a reference to published works, except in one recent and very remarkable instance.

During the storm of last October 29-30, such remarkably sudden and violent shifts of wind took place, about the same time, at many places in a nearly meridional direction across England, between or by Oxford, Greenwich, Nottingham, and other places, that to meteorologists even they seemed unaccountable; but if we contemplate parallel currents, side by side, moving rapidly in opposite directions, and having also a lateral movement to the eastward, such sudden and meridional changes may become as easy to comprehend as those so well described by aeronauts who passed out of one stratum or current of air into another, so closely superposed that while the balloon was tilted (dragged aside as it were) by the one, the car was influenced differently by the other.

This momentary effect was accompanied by a rushing sound like that of a torrent of water. These currents had different temperatures, electric characters, degrees of dryness and moisture, and horizontal motions. The sound, caused by pressure and friction, is suggestive of various ideas in connexion with heat and electric considerations, inadmissible here.

In this case, of course, the representative of an observatory moved vertically through horizontal air currents, at times differing in velocity (referred to earth's surface) from some 30 to 60 miles an hour. In the former instance—that of a land station—the currents were separated vertically, their division passing across any place suddenly, but horizontally.

At the present time our meteorologic communications are utilized, and highly appreciated on the Continent.

At about 10 o'clock in the morning (as soon as in London) Paris receives notices of wind and weather, from our most distant stations, and distributes them.

Two hours afterwards the French Government despatches our forecasts, and (if any) cautionary notices to more than 18 stations on the coasts of France.

This British system has, therefore, incurred a large responsibility.

What does it cost? is, of course, a frequent question. The Meteorologic-office of the Board of Trade, and for the Admiralty likewise, was established in 1855, with a yearly estimate of £4,200.

This was for many duties, exclusive of those now superadded, not then contemplated.

To include and provide for all—with these additional objects and their contingent expenses—I now ask to have £5,800, being only £1,600 more than in 1855-8, when meteorologic investigations had not led to their practical utilization nationally.

In conclusion, may I be permitted to say that, while admitting many errors of judgment and numerous instances of tardy decision, it has been proved by general opinion of the maritime, if not also of the agricultural interests, that the system of meteorologic information existing now under the Board of Trade is worth its cost to the nation, and is deserving of efficient maintenance.

R. FITZROY.

Dec. 2.

SALE OF THE EARL OF STAMFORD AND WARRINGTON'S STUD AT NEWMARKET.—On December 3rd Messrs. Tattersall sold 66 race horses and a cob, the property of the Earl of Stamford and Warrington. The sale, which took place in the paddock adjoining the house, yard, stabling, &c., recently taken by his lordship upon the expiration of Baron Rothschild's lease, was not numerously attended. There were present—the Duke of St. Albans, Lord Burghley, Lord William Powlett, Colonel Mark Wood, Captain Alexander, Mr. G. C. Greville, Mr. George Payne, Mr. Henry Savile, Sir Tatton Sykes, Mr. R. Ten Broeck, &c. The 66 horses sold realised 28,750 guineas, being within a fraction of an average of 436 guineas each. The 29 animals in and out of training of miscellaneous ages averaged within a fraction of 236 guineas each, the lot passing the hammer for a total of 6,840 guineas. The two-year-olds, numbering 18, fetched 11,635 guineas, being fraction over 647 guineas each. There were 19 yearlings knocked down for a total of 10,275 guineas, being an average of a fraction under 541 guineas each. The highest price of the miscellaneous lot was obtained for Onesander, who, after winning the Ascot Derby Stakes (in which he beat Queen Bertha), fell "amias." He was purchased by Mr. T. Wadlow, the trainer, for 1,000 guineas. Gemma, Barchettina, Limosina, Revolver, Bertha, Knave of Trumps, and Heaper were the next high-priced lots; whilst Imaus, who in 1861 was such an immense favourite for the Two Thousand Guineas, fell to the bid of an Irish gentleman for 20 guineas. The feature of the sale was the Derby favourite, Cambuscan, who, after some spirited competition, was finally knocked down to Lord Burghley, eldest son of the Marquis of Exeter, for whom it was reported the purchase was made, in which case the horse will go into John Scott's stable. The yearlings produced remarkably good prices, the heavily engaged Archimedes, for whom his lordship gave 720 guineas at her Majesty's sale of yearlings, realising the fabulous sum of 3,000 guineas. The next high-priced yearling was Hydaspes, bought at her Majesty's sale in June, for 550 guineas, and now sold to Mr. Ten Broeck for 1,350 guineas. For Lysander, Lord Stamford gave 610 guineas, at the Middle Park yearling sale, and he only realised 180 guineas.

LONDON, OR CENTRAL FARMERS' CLUB.

THE BREEDING, REARING, AND FATTENING OF STOCK ON ARABLE FARMS.

The monthly meeting of the Central Farmers' Club was held on Monday evening, December 7, at De Keyser's Royal Hotel, Chatham Place, Blackfriars, the Club having been compelled to vacate the York Hotel, Blackfriars, where it had assembled ever since its formation, in consequence of the ground on which it stands having been taken by the London, Chatham, and Dover Railway Company, for its extension over Ludgate Hill. The attendance was very large. In the absence of the Chairman of the year, Mr. Bradshaw, the chair was taken by Mr. H. Tretbewy.

The CHAIRMAN in opening the proceedings said, since they last met, the Club had been obliged to leave their old quarters. The Committee had, he assured them, been at their side and to get any place at all for the Club to assemble in; but they had at length succeeded in obtaining the rooms in which they had then met. He could wish that those rooms were more commodious; but under the circumstances the Committee were glad to get even that accommodation. He hoped that before that time twelvemonth they would be installed in their new quarters, where they would have every convenience and accommodation that could be required. He would not take up their time with any further remarks, but set once call upon Mr. Coleman to introduce the subject appointed for discussion that evening, viz., "The breeding, rearing, and fattening of stock upon arable farms, and the capability of such farms to produce meat."

Mr. COLEMAN (Park Farm, Woburn) said: Gentlemen, before I make any remarks upon stock, I will just notice the variety of soils upon which they will have to be reared and fattened; and will divide them into three classes—heavy, medium, and light soils. Heavy land has not hitherto carried that quantity of stock we should all of us like, for the reason that it is unkind for the growth of roots; and even when a crop can be grown, it very often injures the land to either cart them off, or eat them on, during the winter months; but now, with steam come to aid the occupiers of such soils, I see no reason why they should not in the autumn get some portion of the land in such a forward state as to admit of very early spring sowing, and by that means almost ensure a good crop of roots. We well know that the heaviest crops of mangolds are produced on clay land when a good tilth is secured and a kind season occurs, but the great drawback to their extended cultivation on such soils is the labour entailed in carting them off, at a season of the year when the farmer is busy with his wheat-sowing and other autumn work. I will not press upon the occupiers of heavy land the necessity of increasing the growth of this root to too great an extent; but some they must have, if they wish to take care of their stock during the early spring months. I would rather see them planting in March a few acres of cattle cabbage (the plants having been reared in some warm corner during the previous autumn), which may be eaten on the land in the summer months, June, July, and August, when it will bear treading with sheep; and I am sure if the fallows after an autumn cultivation were dunged and set up in ridges for the winter, a very heavy crop may be produced. I am no great friend to the cabbage tribe on light soils, as they produce so much woolly fibre that stock cannot turn to any account, but I think them quite worth a trial on heavy land. Every one knows the necessity of having the root on clay land consumed in dry weather, therefore we must try to produce them at such a time. The green globe, and common white turnip, if sown in April, or beginning of May, will be ready for consumption in July; now this is what must be done upon our tenacious soils, or at least attempted more than it has been. I have very often had white turnips ready for use the early part of July; they have been sown in May, as soon as the mangold seeding was finished; if the bulbs have not been very large they pro-

duce a great quantity of top, which is at that time of year more nutritious than the bulb would be in October. I well know the disadvantages a clay-land farmer has to contend against, but I think if a few of my friends try what can be done by *early sowing* even the *commonest* description of turnip, they will not be disappointed with the result. They must leave it to their light-land neighbours to produce swedes for winter use, and grow what they can for summer consumption: sow early and consume early, must be their maxim, and I see no reason why, on such farms, very much more stock may not be kept than at the present day. The medium soils are those which will grow any and every description of root to perfection, and although some of these are a little too stiff to admit of being much trodden in wet weather, still when part of the crop is drawn off for consumption, with bullocks in the stalls, the rest may be used on the land without much detriment to it. Such land as this is properly called turnip land, and produces both the best crops and the finest quality; I know some persons say that a turnip grown on one soil is as good as that grown on any other, but with this I do not agree, as I found when in Norfolk, that the stock did not do so well upon the light land roots as they did upon those grown on medium or mixed soils. Mr. Heath, of Ludham, grows roots upon his land that will fatten a bullock as fast as those upon the light sandy soils of West Norfolk, with from 2 to 4 lbs. of cake in addition. The *heavier* the land that produces the root, generally the better the quality. How is it that bullocks are fattened with such success in the Lothians of Scotland? Why because they produce roots of fine quality, swedes particularly, and also a large weight per acre. Occupiers of our light soils, whether sand or gravel, or a mixture of both, have for many years been striving to increase the weight per acre of their root crops, well knowing that to be the basis of profitable farming, and as they can consume them at any season on the land with sheep, they have a great advantage over their less fortunate neighbours who occupy the clay land: these soils are now most sought after, and will I think still command more attention than they have done, because of the paying price both of mutton and wool. I hear very much complaint of the swedes being diseased, but I think this is in a great measure owing to their being so forced with artificial manure, and from being sown too early. I do not find upon light land that turnips for winter use are the best that are sown first; and another thing against the roots keeping well through the winter is, that the swedes are now much more tender than they used to be; we all like to have the sort that will produce the greatest weight per acre, and, like our improved cattle, improved swedes are not so hardy as they were; they require to be pitted earlier, or you stand a chance of losing them by frost, and when secured do not keep so well as in years gone by. We must use every sort of root in its proper season; white fleshed turnips should be finished by October, swedes from that time to February and March, and then comes that most valuable of all roots, the mangold wurzel; you may use this with advantage all the year round: I have commenced upon a crop in September, and continued until the following August, but they are of the greatest value in the spring and summer months. The mangold is a plant that requires warmth, hence they are much more extensively grown in the east and south of England, where less rain falls; but in the north and west, which are moist climates, perhaps the swede is the most profitable root to cultivate; for my own part I grow half of each as near as I can, and then in a very dry season the mangold makes up the deficiency of the swede, and in a wet one the contrary. For all roots a portion of farm-yard dung, from 8 to 10 tons per acre, with from 2 to 4 cwt. of superphosphate, forms the best dressing. I do not like upon any light soil to see too much dung used, as the most

decayed crop of swedes I ever saw in my life was upon a farm where from 20 to 30 tons had been applied without any artificial dressing. How are the occupiers of arable land to stand their ground with the present low prices of wheat? Why everyone who knows anything of farming will answer, by keeping more stock, or rather I will say by increasing both the acreage and the quantity per acre of his root and green crops. It is all very well to tell a farmer to keep four bullocks, where before he had only three; but let him, before he thinks of increasing his stock, direct his attention to the production of food for them, for if there is anything that does not pay, it is having more stock than he can find food for, although I do not think many farmers now-a-days will have more money than is really necessary to invest in stock, as corn does not fill the pocket to overflowing. I am quite sure that a small number of cattle, well done, will pay more than a large number improperly attended to, or that have to be supplied with innutritious food, such as s'raw to make up for the wants of roots or hay. We will take the production of an acre of roots at 20 tons for a good crop, and a crop of trefoil or clover at 30 ewt. per acre, and see how long this will with proper management keep a fair-sized ox in a going-on state. The food per day shall be—84 lbs. of roots, 6 lbs. of clover chaff, 8 to 8 lbs. of straw chaff. The artificial food shall be put at the quantity I generally use, viz.—4 lbs. of linseed cake, 2 lbs. of corn meal. This gives from the produce of 1 acre of turnips and 1 of clover 76 weeks, keep for a bullock: the artificial food, with cake at £10, and bean, Indian corn or lentil meal at £8 per ton, will cost 3s. 6d. per week per head. Now, it is but a moderate sort of bullock that will not pay 6s. per week for this keep, which will leave £5 per acre for the roots, and £3 per ton for the clover consumed, *besides the manure*; those who do not wish to give clover to their cattle will have to add two pounds of artificial food per day, and use all straw; but I like a portion of each for profitable feeding, if possible. I consider if a farmer (take an average of seasons) realises 5s. per ton for his roots, and £3 for his hay, by feeding bullocks, he does very well, and it is quite as much as many of us do. With present prices of beef of course more is made, but he is a lucky man who this year averages 20 tons of roots per acre. Those who say that cattle do not pay for feeding I would tell to take a trip into Norfolk during the winter, and ask some of the farmers in the eastern part of the county what (with the present price of corn) pays their rents, and they will tell you their bullocks. I consider as profit to a farmer all that an animal makes over cost price, and cost of purchased food, if we value the turnips, as some persons do, at 10s. per ton, we must put a liberal price upon the manure made by his cattle and very, often very much more than it will bear; but upon turnip soils, that will not bear treading with sheep (and as I have before said such soils grow the very best quality of roots), bullocks do, have done, and will pay for fattening, with beef anything like or approaching its present price, if the right sort of animal is purchased at not too high a price to commence with. What is the best sort of bullock for our stalls, boxes, or yards? Without doubt the shorthorn, because as good a sort as any man need wish to have is always procurable at a lower price than any of our other established breeds; and I find if they, the shorthorns, do consume a little more food than the Hereford or Devon, they make more meat, and invariably pay best where a liberal supply of cake, corn, and roots, can be given. Now, unless a farmer knows what is the right sort to purchase, he may soon get tired of feeding bullocks; there are many men who are good judges of a beast when fat, but there are *very few* who know a good animal when poor. You see men looking at a lot of store beast, handling them all very carefully, and pronouncing some good quality, and some bad; but I find the hand but of little use if the eye cannot in a lot tell 19 out of 30 without ever touching them: and now that I am recommending the shorthorn to my brother farmers who may want their turnips consumed profitably, I must explain, that I do not mean an animal that boasts of a long pedigree, for, though no one likes blood better than I do, still I find the best bred shorthorns are not the best *butchers' beast*; they show all their points to perfection, straight back, catchy rumps, nice loin, but not very grand behind the shoulder, and do not generally make such fleshy beast, when fat, as do some of the more common bred ones. I fancy

all our improved breeds of cattle have now-a-days a tendency to produce more fat, in proportion to the lean, than is quite profitable to the consumer, and whenever I have a chance at any of our shows, I like to make a mark against one that carries flesh as well as fat. I have found the Herefords very well in the stall, but much better in the grass field, and therefore our arable farmer cannot compete with the grass men for their possession, at any profit to himself; and if he chose to do so, I should like to know where he is to procure any quantity of good beasts from; there are not a great number bred, and of these the best never get far from their native county, and they do not make growth enough when in the stall to pay for expensive feeding. I consider their place is in the grass field; and although I very often finish a good many in the stalls, and have some in now that will I hope this week make £40 each, still I never like to keep them there for many weeks, and never will put them in unless they are in good condition. The Devon, or red beast of the West of England, is a very useful animal; I do not mean the pure "North Devon," for these are few and far between at our fairs and markets. I did pick up fifteen at last Barnet fair, but I never saw many of them so far from home; the large coarser breed of South Devon are bought by many of our arable farmers, and sometimes worked for a year or two, and then fattened; if put at once into the stall they require a little patience on the part of the owner, but when fat are more selling than almost any other breed, because they have always a good proportion of lean to the fat. The Scotch, both polled and horned, are now nearly all the best of them kept at home, and when fattened, sent to London and our other markets. It is to Ireland we must look for the main supplies to our feeding stalls, as her moist climate and humid atmosphere are more suitable for growing cattle than corn. I trust the reports we have lately heard of the decrease of stock in the sister isle will prove incorrect, for it will be an immense loss to us all if the Irish store cattle came shorter in numbers than they have done; some of my Leicestershire friends will begin to think they may never make any more profit of their good grass land in consequence of the high price of store cattle. The breeding of cattle upon a farm of arable land—is it advisable or not? Well, if I am to give an opinion, I say no; still, as there are few farms upon which there is not some old pasture, a limited number may be bred and reared for the purpose of fattening for the butcher, and, as store cattle are now so high in price, it is a good practice for all occupiers of arable land to keep a few cows, and rear the produce of them. Now, as I know many of our best farmers are adopting this plan, I will give my reasons for thinking it a good one, and how we can best set about it. Let cows be selected of good size, of any breed that may be best adapted to the locality; always give a preference to the particular breed that may prevail in the district, as there is a reason for such animals being kept; for our forefathers had good cause, no doubt, for their choice. Let the cows be fair milkers, and chosen with an eye to that quality. A bull, of as pure blood as can be obtained, should be procured; and if he is not of such great size, it is not of so much importance, as the produce will inherit size from the dam, and quality and aptitude to fatten from the sire. This I find to be the cheapest way of breeding stock for the fattening stall, as I am quite sure our pedigree stock are of no use to the tenant farmer; their first cost would be much too high, and they would require more attention than would be remunerative to him. As our arable land farmer will have his greatest supply of food in the winter, he will manage to have his calves dropped about September and October, as calves born at that time I have invariably found go out six months sooner than those that come after Christmas, even when all have lived together. As dairy produce now fetches a good price, a cow well chosen for milk will always pay for her keep, and perhaps more for the same food than a fattening ox; but then what is the difference in the value of the manure? why, something considerable; therefore let us be careful, and not keep too many; cows will pay for a portion of artificial food, and should always, when good milkers, in winter, have none. A farmer, having selected or bred his young stock, must keep them nicely, and care must be taken to draw a line between too high feeding and too low—the one on the score of expense, and the other for the sake of the well doing of the animal. I would advise an occupier of arable land not to give his young

stock too much straw. The food should be, when a year old, from 24 to 40 lbs. of roots, and 1 lb. of linseed meal or cake, with 1 lb. of oat, barley, maize, or other corn, according to price. This should be boiled or steamed with pulped roots and chaff; from 6 to 8 lbs. of chaff may be given; but care must be taken so to apportion the food as to keep them in a healthy state. I have known many young stock very much injured by the injudicious use of straw chaff, and have lost them myself through it. But after all may be said and done, it is to the fattening of cattle that occupiers of arable land must pay most attention, as the difference in management is often the margin between profit or loss. It is of no use allowing an animal the best of food, if he has an uncomfortable bed at night; he will not make much progress. I remember some years ago seeing 20 very good shorthorns purchased on Norwich hill, in October, by two neighbouring farmers, and I helped them to divide the lot, each man taking 10—the one the red, and the other the roan bullocks; I do not think there was 1s. per head difference between the two lots; yet, when they came to market the following spring, one lot made, if I remember right, £3 to £4 each more than the others. Upon asking the reason of this difference, knowing both lots to have had the same quantity of artificial food, I was told that the owner of the cattle, that paid the most money, made as much fuss with them as he did with his children; the others were only attended to in the common way. This taught me a lesson I shall never forget, and I imagine many other farmers would be better for just such an one; for, when I go into some men's stalls and yards, I do not find the comfort of the animal studied so much as it ought to be; and we may be well assured, without great attention, bullocks, instead of paying, or helping to pay, the rest on arable farms, will be looked upon, as they are now by some people, as a necessary evil, and called nothing better than manure manufacturers, and expensive ones too. When cattle are first put into the stalls (say in October), I prefer boiling the meal or cake, and mixing the roots with the chaff, pouring the liquid over them, and leaving the mixture either in a heap or cistern to ferment for 24 hours. By this means the chaff is made more palatable, and the mixture eaten very readily. At this time the roots will be pulped or minced, and may be continued the first eight to ten weeks with the bullocks in the fattening stalls; but when the cattle become about half fat, or within a month or six weeks of being ready for the butcher, then give the roots raw, and the corn and cake dry. The butchers say cattle fed on cooked food do not weigh well, nor do they turn out so full of fat, and the flesh is far from so firm as they wish it to be. Now I know this to be correct; and an instance occurred only last spring, shewing that, without a fair allowance of roots, cattle fed in winter will not give the purchaser satisfaction. My brother, who farms in Norfolk (upon the estate of Lord Wodehouse), had 25 very nice shorthorn steers in his yards, when I visited him last February; he was giving them pulped roots and clover chaff, with a very small proportion of straw, if any, and from 4 to 6 lbs. of cake or meal. They were sent to the Metropolitan Market in April, fat, and I, happening to be there the following week, saw Mr. Thos. Burrell, the well known cattle salesman, who came and asked me what my brother had been feeding his bullocks upon, as the butchers who bought them complained most terribly of their weighing so badly, and turning out such brutes. The credit the Norfolk maintain in the London market, from January to June, is owing to the abundance of roots with which they are supplied, and I would have some of my friends remember this, who think that cattle can be fed without any roots at all. I will now notice the values, according to a farmer's notion, of some of the artificial foods that are most in vogue in the present day. Without doubt, that which stands first is linseed cake, and, when moderately pure, deservedly so; but we must be careful what we purchase, and be guided by our own "palates" as the best test of its genuineness. I prefer to mix meal of some sort with cake, when a good portion of roots is given; but the relative prices of each article will rule this. Now that most feeding meals are cheap, such as beans, barley, maize, lentils, and others, it is a good practice to use crushed linseed, in proportion of about 1 to 5; this does not add much to the expense, and carries off the heating and binding properties of corn meal; and when cattle are eating mangolds, I prefer meal to cake, and give a larger proportion, if possible. Cotton-seed cake is, I find, very useful on grass, or when cattle in stalls get mangolds, from

its astringent qualities; but it is rather dangerous when imperfectly ground and manufactured. I have had to make a claim within the last few weeks (upon a vendor of it) for a neighbour, who lost two strong Welsh beasts from using it, and the quantity was only 4 lbs. per head per day, thrown to them on the grass land. Professor Voelcker, when the cake was sent him for inspection, said he might as well give cattle compressed "cherry stones," as they would be quite as digestible; so mind, when purchasing cotton-seed cake, and let the seed be well crushed, and the cake have a mealy appearance. Decorticated cotton cake I never did like, and, after repeated trials, gave up using it; but the whole seed cake I use now for store cattle in the yard, being very particular not to give too much, and then rarely or ever to very young stock. The experience of others may differ, and, if so, I shall be glad to hear that I am wrong, as, from its reasonable price, it is just the sort of food a farmer would like to use more extensively. Rape cake I like very well, upon light land, for manure, but do not think it profitable for feeding, notwithstanding what great authorities may say upon the matter. I am now taking a practical view of things, and putting aside all analysis of the various foods given to cattle, as I consider them but of little or no value as a test of their fattening properties, or why does linseed show no better quality by analysis than rape cake? Maize, lentils, beans, peas, barley, are all good food for bullocks, when ground fine, and given in moderate quantities; but no one of them separately will increase the weight of an ox so fast as linseed cake, nor will the manure from them be so valuable. We have heard some statements about cattle eating 28 lbs. of cake per day; now I believe this, in a few instances, has been exceeded, and yet, when the cake has been pure, no ill effects have resulted, except to the farmer's pocket. The most artificial food I ever had a lot of bullocks eat was 21 lbs. per day, consisting of 14 lbs. of cake, and 7 lbs. of barley and bean meal. This was 20 bullocks that I purchased some years ago at Wragby, Lincolnshire, in October; and, as soon as I had bought them, the late owner came up to me, and told me, as a young man, to mind what I was after with them, as they had been having 14 lbs. of cake per day upon the grass. They continued eating the quantity I have named until the Smithfield great market, to which most of them went; they paid me about £8 per head for 10 weeks' feeding; so I got a lot of extra good manure, and very well out of a business I can tell you I did not much like, for I would not have had them, had I known their antecedents. Is it not often the case that, when we buy beasts to put in the stalls, they have been living too well to make the improvement we expect with the food we give them? I like to commence with 4 lbs. of artificial food, when cattle first go into the stall, and gradually rise to 8 lbs., so that they average 6 lbs. per day for the whole time they are feeding. If they do not pay for this quantity, they rarely will for more, unless very good large beasts indeed, and when finishing for Christmas markets. Boxes, stalls, or yards for cattle; which are best? Boxes I most certainly prefer, as the manure, being under cover, is superior; but I have found cattle in stalls gain quite as much weight, with the same amount of food, as those in boxes. The cost of cleaning the stalls out, and the manure being afterwards exposed, must be set against the cost of erecting the boxes, the only difference being that the one is borne by the tenant; the other is the duty of the landlord. We know nearly all the Norfolk beasts are fed in yards holding from 10 to 20 in each. This is a system not to be condemned, where there is plenty of straw for litter; for I have had cattle, and well-bred shorthorns, too, when the yards were well littered and dry, prefer the open yard to the shed. I do not think the manure made in a yard, with one third of its space covered by a shed, is very much worse than that made in boxes, notwithstanding what many persons say upon the subject. I have often taken the shed manure and put upon the land by itself, but never yet saw much difference between it and that made in the open yard. Of course no stagnant water is allowed to remain in the yard, but all drains off into a tank. If a landlord, in a district where straw is plentiful and roots scarce (as they are for bullocks in light-land districts), offers to put up his tenant good roomy yards, with one-third covered, I do not think the tenant ought to stand out for boxes, as they are more expensive to both landlord to build and tenant to occupy; but wherever straw is scarce, there it is necessary to have boxes to economise it. I have been asked by a friend to tell ten farmers how to make bullocks pay upon straw and 7 lbs. of

cake per day. Now this is a question that will, I think, puzzle even a fen farmer himself to answer, as their straw is hardly good enough for litter; and some seasons I am sure I pity the animal that has to exist upon it. The occupiers of fen soils must grow, as Mr. Ruston does, a large lot of mangolds, and, by pulping and mixing with straw, he may make his manure at a cheaper cost than by the dry system. I will here remark that my experience as to the value of straw is this; sweet barley, oat, pea, and bean straw, in the order named; wheat I do not like for cattle at any time, although sometimes compelled to use it. I look upon straw at best as little more than filling up stuff, allowing the animal to digest more fully the highly rich nitrogenous food that is given to a fattening bullock. I have now 70 fat cattle in the stall for Christmas that eat 1 bushel of hay chaff per day; but they have a like quantity of old hay chaff, 8lbs. of cake and corn, and 2 bushels of swedes. We very much want a machine to prepare the straw in a more digestible form than chaff, and I hope our agricultural engineers will try and see if something cannot be constructed. It is the *indigestibility* of straw that prevents its being more extensively used in the feeding of farm stock. We all now-a-days, as occupiers of arable land and barley growers, feel very much interested in the course that will be pursued with reference to the "malt tax." If we farmers are not allowed to use malt for our stock feeding, free of duty, it will be a great injustice, for we well know only the worst qualities of barley would go for this purpose, and therefore not in the least affect the revenue derived from malt made for the purposes of brewing. I see farmers are asked to come forward to give the result of experiments as to the value of malt as food for cattle. I know this much of its value that, if I have an animal getting up for show purposes, there is nothing like a portion of malt, ground fine, and mixed with its food. I now use several hundred quarters of barley every year; and, if I were allowed to turn this into malt, instead of its being applied to the production of the lowest priced meat (viz., pork), as it now is, it would be used in producing beef and mutton, and would, I am sure, very much save the farmers' cake bills. I have, I am afraid, devoted too much time to the cattle on arable farms; but I felt that, if not of so great importance now-a-days as sheep farming, still there was more room for improvement in the management of horned stock than in that of the fleecy tribe. My remarks relative to the production of cabbage, and common turnips, for consumption in the summer months, will be of even more service where a farmer prefers sheep to bullocks, for we know that at present prices sheep are kept at much less expense than cattle, as regards labour, and as they produce very nearly the same weight of meat for a like quantity of food as an ox, and the *wool besides*, they have an advantage in every manner, and therefore it does not require any words from me to impress upon the occupier of arable land the necessity of sheep farming. I will notice the various breeds, and for what purpose they are best adapted, and with a few remarks upon the breeding flock, and the sheep when fattening, will draw this paper to a conclusion, as I am sure I must be already trespassing too much upon your valuable time. Every occupier of arable land will see the necessity of breeding as many sheep as possible; upon light soils as many as he can feed off in the winter with turnips; and on heavy land, by the growth of early cabbage, coleseed, and common turnips, he will have his lambs by October ready for his light land neighbour to winter; and as store sheep now command very high prices, I think this is perhaps the most paying game. There is nothing like a fattening sheep upon arable land, the manure made by him for the succeeding corn crop, costs nothing, and what is the result? why, such crops of corn as no artificial means can produce. The flock of ewes, at the time of being put to the ram, will be given a little better keep, as it is conducive to a good healthy crop of lambs that the ewe should be in an improving state at this period. During the winter, a portion of turnips may be given with straw and hay chaff, and a few crushed oats or malt combs; but I do not like giving ewes cake when in lamb. Swedes are not good things for ewes to live entirely upon, but do no harm in small quantities; mangolds I never like before lambing, as I have generally had luck when using them. The time for the ewes to lamb must be guided by the district in which our arable farmer is located, the sort of sheep he keeps, and the food he may have for them. At this early season of the year, where I have grass land to run them, and can spare

a quantity of mangolds for the ewes, I prefer February and March; but the latter month, and April, will be quite soon enough, where the seeds are the main dependence for early food. Having got the lamb, care must be taken to keep it going on, and it is a good practice to divide the field, and allow the lambs to run forward. By this means we are enabled to take them from their mothers earlier, as they learn to feed by themselves sooner than if left with the ewe. Upon arable land, and where the lambs are intended for fattening purposes, they are usually taken off the ewe in June, as soon as some part of the seeds have been mown for hay, and then turned on to the eddiah; and if a few early cabbage are ready to throw to them at this time, it will be of great benefit, when grass keeping is very short. As soon as taken from the ewe, the lamb should have a small quantity of cake or corn, as nothing pays so well for it as a sheep at this age—such as are intended for fattening, at a year old, I mean. Of course, store sheep, that are meant for breeding purposes, need not live so well. Do not allow the lambs to go upon seeds that have been closely eaten down, and much manured by sheep in the spring, as it is very unhealthy for them indeed; and many farmers know, when once a lot of lambs begin to "scour," the loss they have suffered; so remember prevention is better than cure, and never keep the lamb too long upon the same food, but let it have a frequent change. The occupiers of chalk land know the advantage of sainfoin for young sheep, and I wish very much our sand land would produce it, but, after repeated trials, I am obliged to give it up. Dutch and red clover must be stocked with lambs very carefully at first: it is best to put them on for a few hours in the day, and that in dry weather, before they go on to it altogether. I have seen much damage arise to a lot of lambs turned into a piece of Dutch clover fresh and full in the head. I expect to see our friend have upon his farm, by the beginning of August, some turnips to throw to the lambs on his clover eddiah, and if not quite ready, cabbages until they are. By giving turnips in this way, for a month or so before the lamb is put upon the turnip land to fold, you stand a much better chance of keeping the animal in a healthy state, and there is not a loss of time and weakening of constitution, which necessarily occurs in any sudden change of food. The lamb, when put upon the turnip land, should commence with a few hybrid turnips, or swedes and white mixed, as it does not do to give all swedes to young sheep at this time of the year, or you will stand a chance of losing very many of your legs, as they are now called. When first put upon turnips, a liberal supply of clover and straw chaff must be given, and cake and corn in moderate quantities the first few weeks, to be increased as they get more accustomed to the food. Collected on many of our deep loamy soils is very often grown, and there is no green crop that will fatten sheep faster or so fast. I like it for finishing old sheep for the butcher, but find that tegs taken off it, and put on turnips, make but little improvement for some time afterwards. The swedes having lasted our sheep until the end of March, we now commence on mangolds for them, and at this time change the food if all cake, and give some corn, such as peas, beans, or lentils. Cotton seed cake may now be used with advantage, and, mixed with the linseed, will keep the sheep in a healthy state, now mangolds are given. If we take a good crop of swedes, as before, to be 20 tons, and allowing a sheep to consume from 15 to 25lb. per day, besides chaff and artificial food, we have 250 to 400 head kept one week upon an acre. The difference in the quantity consumed will vary according to the size and breed of sheep; a small Southdown will eat about the smallest quantity, and a large Cotswold or Lincoln perhaps even more than the highest figures. It is a bad teg that will not pay 1s. per week for feeding on turnips; of this amount it will cost about 4d. per week for artificial food, leaving 8d. as the return made for turnips, chaff, and attendance. This, taking only 250 sheep as kept upon an acre of turnips for a week, will give £8 6s. as the return for the turnips, hay, and attendance, *besides the manure*, which may fairly be valued at from £2 to £3 per acre more; but suppose we only take half this estimate, and make the sheep pay 45 per acre for a crop of swedes, as, take the country through, the average is not more than 12 to 15 tons per acre, and perhaps in some seasons not up to this. Sheep are much less expensive to feed than beasts, hence leave more profit; and I would have our arable-land farmer keep as many of them as possible; and now I must add a few words as to the sort best adapted to our great arable land districts. On account of the high price of long or lustre wool, I will begin

with these breeds that produce that quality, for it is not only the price made, but the quantity grown on each sheep, that makes it so worthy of a farmer's attention. The Lincolns are the great wool producers, and I have heard of a flock of sheep, ewes and tugs together, that this year averaged in July £1 per head for their fleeces. The Lincoln requires a good soil and rather succulent herbage, and is no doubt a very fair consumer. Notwithstanding what may be said by breeders to the contrary, I place them at the head of all our breeds of sheep for this quality, as it is preposterous to suppose that a sheep of such large frame, and with such a heavy fleece, requires no more to support it than a small Southdown. Any where in the Midland or Northern Counties if our friend happens to be, let him procure sheep with some affinity to the Lincolns, either Lincoln-Leicesters, or Leicester-Lincolns, and there are flocks in this country so convenient that they can supply him with both. I never bred a long-wooled sheep in my life, and am a lover of the Downs; but had I to start for myself now, and in almost any place in the district I have named, I should go for wool. As we cannot compete with the foreigner in wheat, let us produce that article for which he must be content to be our customer, and leave the fine wools to those who like to grow them. The pure Leicester is fast giving way to the Lincoln cross, and, with more wool and less fat, will be scarcely distinguishable in a few years from the improved Lincoln. In the Eastern Counties a short-wooled ewe is kept and crossed by a Lincoln or Cotswold. This is a good practice, as the lambs are fed off at a year old, and the first crops are very fast feeders. In the south and west, the Sussex and the Hampshire Down are the breeds most in favour, and upon their light soils, and from the dry climate, they answer very well; but I know the breeders of such a class of sheep must look with longing eyes to the returns made for the wool by the Lincoln men. I find it takes a fair flock of Southdowns to weigh, as tugs, 6 lbs. per head, these at 1s. 9d., its value last August, gives 10s. 6d.; but a lot of Lincoln tugs will clip 12 lbs., which at 2s., its value at the same time, will be 24s., and the carcase of the Lincoln sheep shall be worth as much and more at a year old than the Southdown; however, we cannot all keep long-wooled sheep, but many more of us may with advantage than at the present day. The Cotswold, bred in large numbers in Gloucester and Oxfordshire, and the large counties adjoining, are big and useful sheep, but with far from the wool-bearing properties of the Lincoln, and are principally used by our flockmasters to cross with the Southdown and other short-wooled ewes. There are two breeds of medium quality, I mean the Shropshires and the Oxforas. The Shropas are a really good class of sheep for cold, wet climates, and in fact will do well upon almost any soil; they carry more wool than the south or west country Down, fatten at an earlier age, and are worth quite as much per lb. when fat for the butcher. The Oxforas are like the cloth of that name, quite a "mixture," Cotswold, West Country Down, and Shropshire, all having done duty at different times with the most eminent breeders; they are noted for dark faces, big frames, and heavy fleeces, and if the present breeders can keep up their size, quality, and character, they bid fair to be deservedly popular, and worthy the attention of our arable farmer, particularly if he is upon thin, chalky, or rocky soil. The necessity of the present day compels our arable farmer to keep that breed of sheep which will make him the greatest return when fat, at the age of 12 to 14 months; we cannot afford to keep our sheep on such farms, eating artificial food for a longer period; if we do, we shall not be paid for the outlay. And I would advise, where practicable, either a long-wool or cross-bred sheep, although greater consumers than the Down; as I can assure you a pure-bred Southdown is not kept for nothing, and I very much question if some of our big-headed Downs are not so great consumers as the long-wool. Why is arable land preferable to grass land for the fattening of stock? Because it does not matter how poor the land is, provided it will grow a crop of roots; and also because the artificial food used makes a greater return in the succeeding corn crops than it would if used upon grass land. If the occupiers of arable farms will take care to provide crops of cabbage, coleseed, and roots, to follow each other in succession, so that they have food for every season of the year, I contend that upon the four-course system more stock may be kept upon such farms than if the whole of them were laid down in grass, the extreme West of England and very wet climates excepted. I would impress upon the occupiers of our clayey or tenacious soils the necessity

of trying to increase the production of meat during the summer months, for it is at that time of year that it often pays best, as we have witnessed during the last 25 years, such an immense increase of meat being made during winter (through the extended growth of turnips, and the use of corn and cake upon arable land), as sometimes almost to inundate the market. Clay-land farmers well know the necessity of being on their land in dry weather, and will, I hope, make an effort in the direction I have pointed. We know we cannot upon our best grass lands much increase the production of meat, and as every year the consumption goes on gaining ground, there will be an opening for our occupiers of clay land to see what they can do. I wish to be understood as meaning, that the cheapest way to grow corn is by keeping plenty of stock, and doing them well; and generally if one does not pay, the other will make up the deficiency. Just now increase your root and green crops, and by that means, whenever corn should rise above its present value, you will be enabled to take a few extra crops when they pay you well, and with long leases (without which you cannot be expected to invest money upon another's property), you will prove that the British farmer is not quite "done up" yet. Our occupier of an arable farm will, I am sure, take care and have a lease of his farm before he starts upon modern improvements, for it is far preferable to any, and the best of, yearly agreements; and I hope those landlords who object to granting leases of their farms (on the plea of giving the management of their property into the hands of others) will see it is their duty towards their country to give to the occupier of the soil security of tenure, or they cannot expect a man to become a good farmer and an enterprising tenant. I have now done with our friend the occupier of arable land, and if he will follow some of the advice I have given him, I think he will say with me that it is not stock versus corn, but stock versus corn, and such corn produced at a cost that 5s. per bushel for wheat will not frighten him when rent day comes round. I wish very much this subject had been treated by some one more able than myself; one thing about my remarks, they are my own notions, as I have not consulted or quoted any authorities; and I hope we shall now have a discussion worthy of the Central Farmers' Club and the assembly of gentlemen I see before me.

Ald. MEECH said he was really quite ashamed, as an apron-string farmer, to take the lead, and he only did so because no one else seemed disposed to rise. He felt very much indebted to their intelligent friend Mr. Coleman for the able paper which he had just read. He did not agree with that gentleman in all that he had said, more especially with regard to the consumption of cake. It was all very well to say that they should grow plenty of roots on poor arable land. That was of course desirable; but before they could get their roots they must apply a large quantity of manure, and he believed that on a poor farm they must consume a great deal of that food which produced the largest result in manurial deposits (Hear, hear). A good deal had been said lately about the quantity of cake that might be consumed with advantage. He had received a letter from Mr. Hudson, of Castleacre, which the meeting would perhaps like to hear (Hear, hear). It was as follows:—

"Castle Acre Lodge, Brandon, Dec. 5th, 1863.

"MY DEAR SIR,—You will no doubt have an interesting discussion at the Club next Monday evening, and I wish I could be there, but I cannot. Had you in your letter last Monday in the *Mark Lane Express* said forty years (that being the time we have had the Castleacre farms) instead of twenty-five years, you would have been much below the mark. £1,000 a-year for purchased manure is considerably less than has been applied here upon the average of the forty years; and during the last eight years, since we have had an addition of some 400 acres, the amount laid out for those fertilizers has been much more; and, as regards linseed-cakes and feeding stuffs brought on to the farms during the time, it amounts to a deal more than you stated. I have this season been grasing 130 beasts on half-a-peck of wheat-meal, all the linseed-cake they like to eat (about 14lbs.), 1 cwt. of cut swedes, 1 bushel of cut clover, hay, and what cut and long straw they like (which is not much) per day. They are fine oxen. I was offered £44 each for one yard this day, eight in number. They will be sold at the Attleborough auction next Thursday. My stock consist of 70 very prime Shorthorns, worth from £25 to £45 and £50 each; 47 Devons, the best quality I think I ever

had, and will be ready to sell as soon as the Shorthorns are gone; 35 Shorthorns and 56 Highland Scots, getting over the feet and tongue disease, ready to take the place when the forward cattle are gone to market during this month and next. These latter are living upon oval, turnips, and half-a-peck of wheat-meal, and 6lbs. of cake a day each; but they have to lie abroad, as my yards are all full, and it takes me from thirty to forty waggon loads of straw per week to keep them littered. You are quite right in saying the lands of England are not much above half-farmed. Depend upon it there is not near enough capital employed upon it. My son is grazing about 100 head of very fine Shorthorn oxen, worth from £25 to £35 and £40 each. Some are going to the Christmas market on the 14th. Our hoggets are doing well upon cut swedes and 1lb. of cake with half-a-pint of peas (nipped) a-day. I had one killed last week weighing 83lbs. There will be a large quantity of wheat used this season in feeding cattle and pigs: it is the cheapest food we can give them; but I fear it will tell a tale by-and-bye. The people of England want cheap food, and the only way to obtain that is to employ more capital, and knock off the restrictions that press upon the cultivation of the land: *repeal the malt tax*, as well as the bread tax. Yes, that will be done when there is an honest Parliament, *THAT will choppen the poor man's beverage as well as take off the wine tax, to please the pampered palates of the RICH.* Where are friends Bright and Cobden. I suppose they count themselves *honest men*? My letter-bag is waiting, and I must beg to conclude, wishing you a pleasant evening on Monday. I am, my dear sir, yours very truly,
JOHN HUDSON.

"J. J. MECCHI, Esq."

Now, there was a practical man, who was certainly carrying out the principle of looking rather to the quality and quantity of manure than to immediate profit of the animal. He (Ald. Mecchi) could not agree with Mr. Coleman in what he said about decorticated cotton cake. He was sorry to say that that article was not much used in his neighbourhood, but his experience of it was that wherever an equal quantity of decorticated cotton cake and linseed cake were used for feeding, there was a considerable difference in favour of the former. Neither did he concur in what Mr. Coleman said respecting rape-cake. He had used from 100 to 150 tons. A neighbour of his purchased 100 sheep for him (Alderman Mecchi) and another 100 for himself. His sheep were fed with rape-cake, which cost under £6 a ton, and his neighbours with the linseed cake, which cost 10 guineas a ton; and the butchers gave a shilling a-piece more for the former than for the latter. Now, he thought that they were bound in that case to pay some respect to chemical analysis. He did not say that they should take it entirely as their guide; but when the chemist told them, as Mr. Lawes had done, that the manure from a ton of rape-cake, estimated according to the price of guano, was worth £4 18s., and that manure from the same quantity of linseed-cake was worth only £4 10s., although it cost so much more than the other, it was easy to understand that the manure from the rape-cake, which might not be so pleasant in flavour, had superior fertilising qualities to that from linseed cake. As regarded Lincoln sheep, Mr. Hudson, who was undoubtedly one of the very best authorities in England, loved them so well that he tried them over and over again; but in spite of all the high feeding which he could give them, his land was not good enough for them.

Mr. COLEMAN observed, that he did not include the eastern counties; they were too dry.

Alderman MECCHI continued: It was quite clear that such sheep could not be produced with advantage on ordinary soils; but wherever the soil was sufficiently rich it was desirable to have them, as they were then a profitable as well as beautiful breed. In speaking of stock Mr. Coleman forgot to mention that deep cultivation was one of the most important means on heavy soils of producing roots. He (Alderman Mecchi) had this year grown an excellent crop of swedes, about 25 three-quarter carts per acre, on very poor heavy clay, which was trench-ploughed in spring and worked about in the summer. He did not expect to see there a very good crop of roots: they did not appear large, but the result of that deep cultivation was that the bulb was so buried in the soil and went down so straight that his people were astonished at the quantity produced. None of the roots, he might add, were diseased or mildewed. Again, with regard to cabbages, he should say take a good crop of tares for summer feeding

before taking cabbage. That had been his practice; and in that respect he agreed with Mr. Coleman, that they should try to make plenty of meat in summer-time on clay lands. That could not be done, however, without covered yards to keep the animals cool. They did that also with sheep kept out of doors. They should pursue their object in both ways. They should make their straw into manure with green food, and plenty of other feed brought on the farm, and then there would never be any complaints of being overdone with straw. He was always sorry to hear a man talk about having so much straw that he wanted an open yard to put it in, as in his opinion that showed that he did not keep stock enough. He had himself never produced more straw than he required. With regard to the summer crop, if after tares they put the dung on the land acre by acre, and trench-ploughed it in, they would in that way secure a fine crop of cabbages. His plants were put in towards the end of June, when there was almost always rain, and they had enabled him to feed a large amount of bullock stock without infringing on his swedes, which were put by, to be followed after Christmas by mangold wurzel. He agreed with Mr. Hudson that they did not any of them farm well enough. If they had twice as deep cultivation and twice as much manure, the result would, he believed, be more profitable (cheers).

Mr. JOSEPH MARTIN (Littleport, Ely) said that in most of Mr. Coleman's remarks he entirely agreed; but there were some from which he dissented. With regard to long and short wool sheep, Mr. Coleman properly observed that what suited one county was no criterion for another. His own experience was that in the fen district, where he resided, shortwool sheep would fatten much quicker in the summer than longwool. By shortwool he meant the cross-bred from a Down ewe with a Lincoln tup. The longwool would graze quicker, and do better than the shortwool in the winter being better able to stand the cold. Some observations were made by Mr. Coleman with regard to corn and cake. He (Mr. Martin) had tried both, and his experience tended to show that cake was preferable to corn. He believed that both sheep and bullocks did best on cake, and that the manure was far superior in quality. Mr. Mecchi said that when he heard people say they had too much straw he concluded that they did not farm so well as they ought. He lived in Cambridgeshire, and he should be glad for any gentleman to come and see whether or not he farmed in a proper manner. In the fen district they had certainly some difficulty in getting rid of the straw. He quite concurred in what Mr. Coleman said about getting roots too early. In his district, when mangolds were sown early in the spring, they ran to seed, and of course the mangolds were not so good as they otherwise would be. With regard to turnips, he should be glad to know how it was that they could not be depended upon. Some years ago a crop of turnips would grow and keep well, but that was certainly not the case now. Was this a result of using artificial manure? As regarded tares, he knew that in his own district they did not appear to suit the land. As to straw, he might remark that he had for the last few years had it cut into chaff for his stock, and his animals had done well upon it. He had given with it a large quantity of roots and cake, and he was very well satisfied with the result.

Professor COLEMAN wished to call attention to one point embraced in the paper which had been read, namely the comparative return from the root crop as consumed by cattle and by sheep. He thought Mr. Coleman valued the root crop at 5s. a ton, for consumption by cattle. In that estimate, Mr. Coleman had not, he thought, made sufficient allowance for the expense of delivering the crop at the farm buildings. If Mr. Coleman's calculations were correct, a crop of 20 tons per acre would pay £8 6s. when consumed by sheep, and thus the feeding of sheep on medium arable land was more profitable than the feeding of cattle on similar land. No mention was made by Mr. Coleman of vetches as summer food. There could be no doubt that the vetch crop succeeded very much in proportion as the land contained a certain amount of lime; but he maintained that on limestone soils the vetch crop, being sown in such portions that the consumption would extend from the 1st of May, or even earlier, to the middle of July, was the most important crop the farmer could have for the summer keep of his sheep. Nothing could be better for the fattening of sheep after the swedes were consumed, or for feeding the lambs when separated from the ewes. He agreed

with Mr. Mechi as to the comparative value of rape and cotton cake as manure. He had met with a curious instance of feeding with rape. Some years ago green German rape was used for some young cattle, which were bred on the farm. When these cattle were put into boxes for feeding, linseed oilcake was substituted for the green rape. During the latter part of the feeding process, the herdsman happened to try the two, and the result was that the green German rape was preferred to the oilcake, and the feeding of the animals was finished with that article. He thought, therefore, it was an error to suppose that the value of rapecake was so much inferior to that of oilcake. The difficulty was to get beasts to consume it. If that could be got over, it would, he believed, be found as valuable as linseedcake. The same thing might be said with regard to decorticated cotton cake. It was also a mistake to suppose that decorticated cotton cake was a cheap article. It was so formerly, but that had not been the case for some time, owing to the interruption of the supply from America. With regard to the description of sheep which were best suited for different districts, he (Professor Coleman) begged to suggest that the wool depended in a great degree on the presence of lime in the soil. It had been remarked that evening that a heavy fleece and a heavy carcass could not be grown on a poor soil. That he denied *in toto*; and he might adduce in support of his denial the excellent character of the sheep which were grown on the Cotswold Hills, on soils both poor and thin (Hear, hear).

Mr. JAMES WOOD (Ockley, Hurstpierpoint, Sussex), said: Concurring, as he did, in almost all that fell from Mr. Coleman in introducing the subject, he probably should not have risen but for Professor Coleman's remark as to the value of vetches. He had reason, from experience, to doubt the correctness of that gentleman's view. In Sussex it was customary to depend a good deal on tares for the feeding of tegs on the heavy clay soils; and it was supposed that Southdowns thrived upon them. His own opinion was that the animals never got on upon tares; and he had sometimes thought that that might be obviated by the addition of cabbage. In fact, a large quantity of sheep in his neighbourhood were fed on tares, with a good allowance of cabbage; and he had scarcely ever heard of an instance of any of them having cake. Last summer, having four heifers which he did not know where to turn out, he determined to feed them on tares; and, as he gave them also a large allowance of corn and cake, he expected to see them thrive; but it was an extraordinary thing, they never appeared to be satisfied (laughter). The manure seemed to be very firm; but the result, as regarded the heifers themselves, was not satisfactory. That made him doubt whether tares had, after all, any valuable feeding properties in them, or whether, at all events in the case of Mid-Sussex farmers, they were sufficient for the breeding and fattening of stock. He found that even when the pods were formed, tares did not satisfy or improve his animals. He was, in fact, never more disappointed in his life than with regard to the effect of tares.

Alderman MECHI: Have you used them for horses?

Mr. WOOD replied that he had, and had generally supposed them to be good things for horses; but he had been in the habit of allowing his horses plenty of oats as well. When he afterwards put the heifers, of which he had spoken, off tares and on meadow grass that was intended to be mown, with the same allowance of cake and corn that they had had before, they thrived well. He might add that his soil was a stiff clay, one like that of the Weald of Sussex generally, and that he did not believe there was anything in it to make it deficient in feeding properties.

Mr. G. MARTIN (Hubert's Bridge, Boston) said Mr. Coleman had alluded to a mixture of meal with cake. He should like the use of cake done away with, not wishing to see farmers encouraging the foreigner, instead of consuming their own produce. Barley, oats, and peas were only worth 10½d. or 11d. per stone; while an inferior description of cake cost 14d. or 15d. If farmers would consume their own produce, instead of cake, which was scarcely ever genuine, they would be far more independent. When he had used cake, it was in the proportion of one part of cake to three parts of meal; and he had found animals do considerably better with those proportions than when a larger quantity of cake was used.

Mr. DUCKHAM (Baysham Court, Ross, Herefordshire), said he certainly expected that in that large assembly of gentlemen connected with agriculture, they would have heard

something in reply to what had fallen from Mr. Coleman as to what breeds of cattle he considered best adapted for the consumption of food. He had told them that he did not like Herefords, because they were too dear. He also told them that he stocked his own yard with short horns; but he afterwards said that he did not stock it with short horns, but with Irish beasts [a parcel of mongrels]. No, no, not mongrels. He understood him to say that he did not use Herefords but short horns, and then to go on to say that he selected not pure breeds, but Irish breeds. He (Mr. Duckham) thought the value of all kinds of stock, whether placed in the yard or in the meadow, depended on quickness of return. He understood Mr. Coleman to say that he did not select pure-bred animals because the price was higher than that of inferior animals. Now, his opinion and experience was that the better and the purer the breed of an animal was, the quicker and more easily he was fattened; and hence the nimble ninepence, which was as important to the farmer as to others, seemed to him in favour of the pure breeds (Hear, hear). He did not look upon the value of cattle as consisting entirely in their manure-making properties; but he thought they ought to get those animals which would make the largest quantity of meat in the shortest possible time, ever keeping in view their consumption of food. It behoved them as tenant-farmers to economise food as well as to produce a good quantity of meat. One gentleman spoke of his turnips rotting. He occupied a tillage farm, and the last three or four years he had found it requisite, from the same cause, to change his system, and farm upon the five, instead of the four-course, as heretofore; and also because his land had become clover-sick. Upon this system he grew heavier crops of clover, heavier crops of roots, and therefore could keep more stock than on the four-course system. He knew that that was opposed to the general principles recommended of growing more grass, and converting it into meat; but he found that by taking two corn crops in succession after his turnips, he obtained a better crop of clover. He took a crop of wheat after the clover, and he grew better roots and a greater weight on one-fifth of the tillage than he did before, because they were then given to rot. He knew that this could not be done without high farming; but by paying a good deal of attention to the dung-cart, to artificial food and manure, he had been perfectly successful.

Mr. W. WALTON (Chawton Park, Alton), believed that the reason why cotton cake and rapecake came so near linseed cake in value was, that the latter was not one-third as good now as it was twenty years ago (Hear, hear). Linseed cake contained a large quantity of bran, and other ingredients besides linseed. [A MEMBER: And sawdust.] Yes, no doubt, and all sorts of things (Hear, hear). Mr. Coleman spoke of the superior value of cattle in consequence of being kept warm in good covered yards or sheds. Well, they all knew that that depended very much on the landlords. In his own county the principal provision for shelter in many farmyards consisted of a black pond and a waggon shed (laughter). The case was very similar in many other counties. As to tenants, they could not be expected to lay out their capital, without having security for a return; and this the landlords of England generally did not seem disposed to grant. He had recently read in the *Mark Lane Express*, which was a really good agricultural paper (Cheers), that some landlord had given notice that his tenants should not be allowed to sow corn within a certain distance of the hedgerow. We all know what this suicidal conduct means. In contrast to this he might remark that his own landlord asked him only last week why he did not cut a certain row and cultivate close up to the hedgerow (Hear, hear). As Mr. Coleman had said something about the malt tax—Mr. Walton did not ask the Government to repeal that impost as a plea to feed cattle on malt, or that the poor man should have better and cheaper beer, "both very needful," but, as an old free trade farmer, he asked whether it was right to untax the produce of foreign lands, and tax the produce of our own country. Farmers have it in their own power to repeal the malt tax, said he (Mr. Walton) hoped at the next general election they would do so.

Mr. C. HOWARD (Biddenham, Bedford), after thanking Mr. Coleman for his paper, which contained a great deal of general information, said it was well known that the light lauds of this country had hitherto produced the largest amount of meat, and that the clay lands had been behind in that respect. He had expected that his friend would have touched upon this subject, and endeavoured to have pointed out how more stock

could be kept upon such soils. In his opinion a great deal of second or third rate grass land on clay farms had been broken up very unnecessarily, and that the stock producing powers of such farms had thereby been considerably reduced (Hear, hear.) Mr. Coleman alluded to the question of the production of cabbages on light lands. Now, as a light-land farmer he could speak of that from his own experience. Had it not been for a plot of cabbages he would have been thrown on his beam-ends, as it were, last summer, as regarded the keep of both sheep and cattle. As to land becoming turnip sick, he thought farmers should change their roots. His farm was in every respect a turnip-land farm. He dares say it would grow turnips as quickly as any farm in the kingdom; but the turnips were of bad quality, and he would not keep. For some years past he had grown mangold—this year he had grown that entirely; his sheep, his hoggets were now entirely fed on that crop, and never had they done better than they were doing at the present moment. Moreover, the weight of mangold per acre exceeded the weight of swedes in former years. Mr. Coleman alluded very properly to the pedigree stock. They all knew that it would not answer every man's purpose to keep pedigree stock, any more than it would answer every man's purpose to be a ram breeder; but he was sure that Mr. Coleman would agree with him that it was important to keep that breed of animals which would fatten with the least amount of food. Mr. Martin made a remark about mangold running to seed. He (Mr. C. Howard) thought that depended very much upon what kind of seed gentlemen got (Hear, hear.) Instead of going to those seedsmen who had their supplies from market gardeners, it might be well for them to raise their own seed; they would not then be so likely to complain of mangold running away. His friend Mr. Mechi said that he never had too much straw. It was not often that he (Mr. C. Howard) said anything about what Mr. Mechi had written; but he thought he recollected reading a remark of his some time ago to the effect that the best scrubbing-brushes for animals were ricks of straw about the farm—a remark which seemed hardly to square with what he had said on the subject that evening. He would recommend the worthy Alderman to plant a few first, or put down some rubbing-posts, which would serve that purpose much better than straw (Laughter).

Mr. J. THOMAS (late of Diddon, Southampton) said: Much as they admired the excellent paper of Mr. Coleman, in the greater part of which they agreed more or less, they could not conceal from themselves that a great deal of it consisted of trite axioms and plain truths—of facts with which those who had been engaged in agriculture all their lives were familiar. He had hoped that the discussion that evening would turn not so much on the best manner of growing root crops and feeding cattle, as on the question whether under the altered circumstances of agriculture it was wise and prudent to continue the present system, or whether it would be better to lay land down more generally to grass. He must say he felt somewhat disappointed that the question had not been proposed in that light. The discussion had taken the course which it might have done in a small farmers' club, bearing rather on the best mode of raising crops and fattening cattle, than on the wisdom or advisability of laying down arable land with grass. He passed the whole of last June and a great deal of July on the west coast of Ireland, and had much conversation with the best agriculturists in the neighbourhood, men of wealth, experience, and intelligence; and they one and all told him they had come to the conclusion that it was useless to contend against wheat at 40s. a quarter, and that they had found it most profitable to lay down land to grass for feeding stock, and to be manufacturers of butter and cheese. As to the present exodus from Ireland, it clearly arose from the fact that profitable occupation could not be found for the labouring classes in agriculture: however disposed the landed gentry and the farmers of the country might be to employ them, they could not do it, because it involved a considerable loss on the outlay. In a certain degree that remark applied to England; it did not apply to the same extent, because the soil and climate of England were so different from those of Ireland (Hear, hear). One point which had been alluded to that evening was the serious call now made on the intelligence of the farmer not to adhere, if he could help it, to the old and worn-out system of cropping. After all the aids which science had given them, and with all the advantages of careful observation and exper-

rience, to compel them to adhere to the old system was not only a disadvantage to them, but a great disadvantage also to the country at large. Another question connected with that had reference to the malt tax. A few years ago he had a large quantity of barley sprouted. It was then kiln-dried, and he then fed 100 sheep upon it, and another 100 on linseedcake; and without at all exaggerating, he assured them that the animals which were fed on malt came to market three or four weeks earlier than the others. They made more money for him, and the butcher assured him that the meat was very superior to that which was fed upon cake. Mr. Wood spoke of the insufficiency of tares for fattening sheep; possibly the reason why he found them insufficient was that his cows were *massois sujets* (laughter). During the five-and-twenty years that he (Mr. Thomas) was at Liddington, it was his practice to finish off with that kind of food, and his animals became very fat indeed on tares and vetches. He did not like, therefore, to hear his old friends, the tares and vetches, run down in that room without breaking a lance for them. No doubt short-horns had, during the period he had mentioned, proved to be by far the best beasts, as for one shorthorn that was sold 20 years ago, three were sold at the present time. In conclusion he would remark, that for landlords to bind down occupiers with the agreements of 20 or 30 years ago, which had scientifically become obsolete, was to inflict a heavy blow and a great discouragement on tenant farmers, and on agriculture (Hear, hear).

Mr. ROBERT SMITH (Emmett's Grange, South Molton, Devon) said there was one point which had not yet been mentioned, though it was the foundation of the whole of their transactions, more particularly in the breeding, feeding and maintaining stock on arable farms; he alluded to the difference of climate and their influence on animals. They all knew that warmth was an equivalent for food, and no doubt they all endeavoured to keep their animals warm by some means or other. Warmth was a principle by which the production of all animal food must be regulated, as well as stock. With regard to the paper which he read last year on "Stock v. Corn," it had been anticipated that Mr. Coleman would take up the other side, but he had not done so; and he still believed that the introduction of that subject was exceedingly well-timed, on account of the price of wheat and animal food. There were others, he knew, who did not feel so strongly on that subject as he did, perhaps because they happened to live in a district where the farmer could obtain 5 quarters of wheat per acre, but during the last year he had seen no cause to alter one word of the paper which he read a twelve-month ago. With respect to the remarks of Mr. Coleman as to the sort of cattle to be preferred for feeding, he would observe that he that day had the pleasure of acting as judge with that gentleman at the exhibition of the Smithfield Club, and that Mr. Coleman there differed widely from Mr. Coleman here, when speaking that evening, about Shorthorns (Laughter). In the show-yard his eye was constantly running after the nice and pleasant-looking animals: he was always searching for the sort of animal which was entitled to the gold medal. It was necessary that the cylindrical form or animal boiler should be of the right shape in order that the steam might be properly got up, and maintained at the least possible cost of food, whatever Mr. Coleman might say about its being a lucky thing that the Irish beasts came in, to fill up a gap. As an old ram-breeder—he had now left that trade—he (Mr. R. Smith) knew that one great secret in the production of good rams was, to keep them warm; though, of course, it was necessary also to feed them going on; and thus there must be attention given to the animal heat of the body or boiler. He would suppose a case, *vis*, that their temperature should be at 100 degrees. Thus, when the standard heat of the body was kept up to 100 degrees, the animal was paying for what it ate; when the heat rose above 100 degrees inflammation set in, and, as an engineer would say, something must be done to let the steam off; while, on the other hand, if the temperature of the body were below 100 degrees the animal consumed its own tallow. Therefore it was only common-sense to say that, warmth being equivalent to food, the animal should be kept at such a heat that the food consumed would keep up the steam for the profitable conversion of vegetable and other agencies into animal food—money. One word on the malt question, which, after the allusions made to it by Mr. Coleman as well as Mr. Thomas, might be regarded as included in the subject under consideration. An invitation had been given

by the Government in reference to that subject; and if it were not responded to, it would be said that all the farmers had hitherto said upon it was nothing but smoke, and nothing would be done. There were, no doubt, many breeders in that room; and he daresay they well knew that there were occasional times when their animals were not getting on as well as they could desire, and when the use of malt would be a great advantage. Some of his own animals having got off their feed, malt was given to them; and those which had it certainly did better than the rest. Mr. Coleman made a very important remark in relation to the feeding of lambs when taken from their dams. Those who were localised in the West of England knew that if lambs were fed on vigorous young grasses, that had sprung up after the summer's grazing had been rested, and thus become extremely succulent, that such food would pass through them too rapidly, and frequently produce scour, which brings on all other diseases; but when placed upon land that has been mown—that is provisionally called "after the scythe"—they invariably do well, and escape those fevers that have become so destructive to young sheep. The habit of the lamb was such, that he wanted drier food; and if that point were properly attended to, it would be a great advantage.

Mr. W. SAINSBURY (West Lavington. Devizes) said: Having been a grower of cabbages for many years, he could testify to the value of them for cattle, and more particularly for sheep. A time arrived when they could get neither rape nor turnips, and then cabbages were very beneficial on store farms. He cultivated two-fifths of his arable land with roots; and he had very little fault to find as regarded rotting. With respect to top-breeding, he might observe that he had been a breeder, though not an exhibitor, of Southdown sheep for many years; and he thought the reason why the Southdowns at one time got into discredit, was that the breeders looked too much to the prettiness of the animals, and not sufficiently to its character (Hear, hear). If they wished to maintain a good character in sheep, they should be careful in crossing.

Mr. COLEMAN then replied: As regarded Mr. Mechi's remarks respecting deep cultivation, he knew an excellent

tenant-farmer in Bedfordshire, who grew the best crops of roots throughout the district, and he had never yet seen him cultivate deeper than six inches. A great many people who employed steam in cultivation fancied that that alone would double the crop; but deep cultivation without high manuring was, he believed, of very little service. In reference to what Professor Coleman said about vetches, he would remark that on light land he never saw sheep do well in summer when they were fed on vetches. Mr. Duckham fancied that he had set one breed of cattle against another. He was a breeder of Herefords; but he would not stock a farm with them—not because he did not consider that Herefords were excellent animals, and made as much meat from the food given as any other class of animals; but because the farmer could not get them in sufficient number. He would not recommend Irish beasts if they could get a Lincoln Shorthorn; but he said they must look to Ireland to fill up the gap. A great many farmers were now breeders as well as feeders, and hence they were thrown very much on middle-class beasts—middle class Herefords and Devons, and the common shorthorn—for feeding purposes, and he would recommend them to prefer shorthorns. As to the question of security which was introduced by Mr. Walton, he (Mr. Coleman) had had the honour of serving under two of the most liberal landlords in this country, the Earl of Leicester and the Duke of Bedford, both of whom did give their tenants security (cheers). As he once heard remarked in Norfolk, all that was wanted for good farming under leases was that there should be no restriction except during the last four years of the lease. As to the breaking up of the grass lands, which was referred to by Mr. C. Howard, that question depended entirely on climate—whether the land under consideration was situated in the dry east or in the moist south-west.

On the motion of Mr. Charles Howard, seconded by Mr. Barthropp, thanks were voted to Mr. Coleman for his introduction.

On the motion of Mr. Marsh, seconded by Mr. John Thomas, a vote of thanks was also accorded to the Chairman, and this terminated the proceedings.

ANNUAL DINNER OF THE CENTRAL FARMERS' CLUB.

The annual dinner of this Club took place on Tuesday evening, December 8, at Radley's Hotel, the attendance being scarcely up to the average, but every seat was occupied. In the absence of the Chairman of the year, Mr. Bradshaw, on the Continent, Mr. H. Trethewey, of Silsoe, Bedfordshire, presided.

After the usual loyal toasts,

The CHAIRMAN gave "The Army, the Navy, the Militia, and the Volunteers." He observed, that to the army they were, no doubt, greatly indebted for their present position among nations; and although for eight years its services had not been called into requisition to any considerable extent, yet, he believed, the army would prove in every way worthy of the occasion whatever it might be, or whenever it might come. Owing to the introduction of another force, the militia seemed not to be so much cared for, at all events it was not so much talked of as it formerly was; but as a nursery for the army it was, no doubt, exceedingly useful. The other force to which he had just alluded, namely, the volunteers, was certainly a most valuable addition to the national defence (cheers). The volunteer movement had been more successful than the most sanguine could have anticipated, and, in fact, it had now become, as he trusted it would continue to be, a most valuable institution of the country. He would couple the toast with the name of Captain Shearer (cheers).

Captain SHEARER, of the Hunts Volunteers, in responding, said he almost felt ashamed to do so in the presence of one of the best officers of the Devonshire Militia, Captain Davey. He believed that the volunteer service was of great use in preserving peace. As a volunteer, he had to thank the Government, and the House of Commons, for the additional grant which, as the representatives of the nation, they had recently made to the volunteers, and which he thought would add greatly to the efficiency of the force. He was

happy to say that their numbers had not decreased, though he should be glad to see them larger; and he believed, that if the volunteers should ever be called out for active service, it would prove a valuable auxiliary to the army (cheers).

The CHAIRMAN then proposed "Success to the Central Farmers' Club." He commenced by expressing the gratification he felt at the circumstance that on no previous occasion had their chairman been able to give them so excellent a report of the Club as he was able to do at that moment. Their assets amounted to something over £1,000, which was a great deal to say, and he was happy to add that they now numbered about 500 members. This he regarded as a very satisfactory state of things; he hoped, however, that they would still continue to increase in number and in funds. It had frequently struck him as being very remarkable that so few country gentlemen availed themselves of the advantages offered by the Club, seeing that the facilities which the railways now offered for access to the metropolis were so complete and widely extended, and the benefits of the Club so universally acknowledged. During the last year the Club had been rather unsettled, owing to circumstances over which they had no control. They had been compelled to leave their old quarters at the York Hotel, where they had been established ever since 1848. The premises were required for railway purposes, and the Club, like all other owners or occupiers of property in such a position, had no alternative but to quit. This had been a very anxious subject to the members of the committee, and, casting about and trying what they could do, they at length succeeded in getting temporary accommodation; but within a comparatively short time he hoped they would find themselves more comfortably provided for than ever they had been before. Of course he referred to the new Agricultural Hotel, which was to be erected in Salisbury-square, which, in fact, had been projected entirely

with a view to the accommodation of the Central Farmers' Club; for although the undertaking was being carried out by a joint-stock company, it was in the first instance promoted by the Club, and but for the object referred to he did not believe the scheme would ever have been launched. He was happy to announce that it had warmly been taken up by the public, though he regretted to say the members of the Club themselves had not so generally identified themselves with it as he could have wished; the public, however, having confidence in the project, had taken shares to such an extent as to justify the directors in letting the contract, and by that day twelve months he hoped to see the new club-house and hotel in such a state as to admit of their holding their next anniversary dinner there (loud cheers).

Mr. JAMES WOOD said he had a toast to propose which required no remarks from him to make it acceptable; it was health, success, and long life to their Chairman, Mr. Trethewey (cheers). He knew, perhaps as well as any one in that room, the pains which Mr. Trethewey had taken to assist in the management of the business of that Club, and that in itself would recommend the Chairman to him more than anything else as a member of the Club. He (Mr. J. Wood) was one of the oldest members of the Club, having joined it immediately he heard that it was to be formed; and when a gentleman took pains to attend if possible on all occasions to aid in carrying on properly so useful and noble an institution as he considered that to be, he must say that he highly esteemed him. Believing that that Club had conferred, and was likely to confer, great benefit on the agricultural community, he could not but esteem the man who put his shoulder to the wheel and strenuously endeavoured to promote its prosperity. Besides being an active member of the committee of that Club, Mr. Trethewey was a member of the Board of the Agricultural Hotel Company, which he hoped would be instrumental in raising the Club to that position which it ought to occupy (cheers).

The CHAIRMAN said he felt deeply grateful for the kind manner in which the toast had been proposed and received. He had certainly always felt great interest in the proceedings of the Club, and if any efforts of his had tended to promote its prosperity, it must be very gratifying to learn that such had been the case. He would only add that he hoped, and had every reason to believe, the Club would prosper for many years to come.

Mr. CHARLES HOWARD proposed "The Royal Agricultural Society of England, the Highland and Agricultural Society of Scotland, and the Royal Agricultural Society of Ireland." He said he should not occupy their time with any remarks on the two last-mentioned societies, though undoubtedly both were very beneficial to the agriculture of their respective countries. The Royal Agricultural Society of England was certainly one of the most conservative bodies in this kingdom, making no rapid changes, and never reforming for reform's sake; but he would do it the justice to say, that show it an abuse, and though it might not perhaps admit it at once, it would ultimately reform it (Hear, hear). It was now about to grapple with an abuse which had long been familiar to those who visited the show-yards: he alluded to the disgraceful method of trimming and clipping sheep (cheers)—disgraceful alike to those gentlemen who practised it, and the society for having allowed the practice to continue so long (Hear). It had for a considerable period been denounced by all right-minded agriculturists in this country, and by distinguished foreigners who had done them the honour of visiting the show-yards, and many of whom had been victimised by buying sheep which as exhibited appeared very nice animals, but which when afterwards clipped were found to have most glaring defects (Hear, hear). Notwithstanding all this, however, the Royal Agricultural Society deserved well at their hands as farmers (Hear, hear). It had improved their stock and their implements; it had developed the resources of agriculture, and had raised it in the estimation of the mercantile and manufacturing classes (cheers). It was with great pleasure that he coupled the toast with the name of a gentleman who had long been known to the agricultural world, and who had devoted a considerable amount of time to the management of the Royal Agricultural Society of England: he meant Mr. Fisher Hobbs.

Mr. FISHER HOBBS said when he looked around him and saw so few of his old friends who had attended the first annual meeting of that Club—and he might mention, in passing, that

he saw on his right a distinguished agriculturist of Norfolk, and a man who was distinguished among agriculturists wherever his name was known—he meant Mr. Hindson, of Castle Acre (cheers); while he saw on his left one of the founders of the Smithfield Club, a man whose excellent judgment with regard to stock was admitted by all—he alluded to Mr. Charles Stokes (cheers)—under these circumstances, he said, he felt more than ever thankful that he was enabled after a long illness to come amongst them that day (cheers). It gave him very great pleasure and satisfaction to find his name connected with the toast which had just been drunk, regarding it as he did as a proof that they felt that he had the interests of agriculture at heart. He regretted very much that he could not be at his post at the monthly meeting of the Club in November, to introduce, as he had undertaken to do, the subject of veterinary sciences in relation to agriculture. He hoped that it would be again brought forward for discussion: it was a subject of vast importance, and would bear to be repeated year by year, until veterinary science and practical farming were far more closely connected than they were (Hear, hear). As regarded the Council of the Royal Agricultural Society of England, he could only say that if they had not adopted as fast or as readily as some expected the new schemes and ideas which were submitted to them, still whenever they saw any measure proposed which they felt was certain to be conducive to the interests of agriculture they gave it their hearty support. Many members of the Society had endeavoured for years past to do away with the abomination which had just been referred to. One course of delay was that in the Council it was thought desirable that in such a society there should be as few restrictions as possible; but at last it was generally acknowledged from without that the time was come for doing away with the evil in question. The Council felt that it was better that the change should come as it were from without, than that they should take the initiative; but he congratulated them that the thing was to be done away with, for he believed there was a strong feeling among farmers generally, and also among foreigners, with regard to the clipping of sheep. After the death of the late Duke of Richmond, whose shepherd was the first to introduce the system, he was in hopes that the evil would have at once ceased. He was disappointed; but now that long-wool breeders were equally ashamed of it with short-wool breeders, there could be no doubt that the change would be approved of by the agricultural interest generally (Hear, hear). He was happy to say that during the last year an improvement had been made in the show-yard; he referred to the allowing of public judging (cheers). In the Royal Agricultural Society's yard this change had answered exceedingly well; whether that would be the case in smaller yards or minor exhibitions remained to be seen. To him, public judging certainly seemed to be a move in the right direction (Hear, hear). Although the Worcester meeting was not so favourable as was anticipated, the weather and the railway arrangements being bad, still the balance-sheet would not be found unsatisfactory. The Council expected to have a most successful meeting next year at Newcastle. The prize-sheet was a large one, and the trials of steam-cultivators would, he believed, prove superior to any that had yet been seen. He might add that the classes for stock had been enlarged, so that every description of animal in England and Scotland might compete for prizes. There had long existed an impression that even the Royal Agricultural Society had not given sufficient encouragement to the improvement of the milking properties of animals; but he was happy to say that in future years that point would not be neglected. The Newcastle people, he might remark in the presence of his friend Mr. Ramsay, who was a Newcastle man, said they meant to surpass Leeds. If they did that, they would do well indeed (Hear, hear); but they would, no doubt, do their best. With regard to the other societies included in the toast, he would express a hope that, through their instrumentality, both Scotch and Irish breeds of cattle would be well represented at Newcastle. There was a great deal yet to be done by these three societies. Science had to be made still more subservient to the cause of agriculture. Particularly was this the case in relation to veterinary sciences. He believed that vast losses were sustained every year in this country for want of an adequate knowledge of cattle pathology among farmers, and those who had charge of their animals; and it was for those who had the management of the national societies to take that

matter into their future deliberations (Hear, hear). In conclusion, he wished to congratulate them on the present position of the Club; but he must add that, as an old member of the Club, and one who had laboured in the cause of agriculture for a quarter of a century, there was one question which he should be glad to see settled in their favour. He referred to that burden on British agriculture, the malt tax (Hear, hear). He had worked very hard himself on that question; and he must say the time had now arrived when it behoved the farmers of England, as a body, either to endeavour to get it settled, or to give it up altogether. The tax was so objectionable—it was so monstrous that, when they were in such close proximity to the farmers and graziers of the northern parts of the Continent, these persons should be able to feed their cattle with English malt, and then compete with them against the producers of it in their own market—that he felt persuaded if they made a long pull, a strong pull, and a pull altogether, they would get rid of that obnoxious impost and disgrace to the Legislature of this country (cheers). But he felt certain that the matter rested, in reality, with the farmers (Hear, hear). If they did not exert themselves to carry the repeal of the duty, their representatives would not carry it for them (Hear, hear).

Mr. COVSEMAKER proposed "The Vice-Chairman," Mr. T. CONGRUVE. He congratulated the company on the appointment of that gentleman to be Chairman of the Club in the approaching year. Mr. Congruve was one of the oldest members, and he was an efficient working member and a practical agriculturist; and, to sum up all, he was a very good fellow (cheers).

Mr. CONGRUVE said he felt highly flattered in the manner in which his name had been received. He knew he was very unworthy to fill the post of Chairman ("No, no"), but, having been called upon to do so, he would not shrink from the duties (cheers). He would endeavour to conduct the discussions in a satisfactory manner, and whatever shortcomings there might be on his part, they would, he hoped, be forgiven. Before sitting down he had to propose that they should drink success to the oldest agricultural institution in the country, namely "The Smithfield Club," coupled with the name of one of the judges of the show. He had heard it remarked that day in the Agricultural Hall that the present Show did not come up to the standard of excellence which had been previously established. He thought that might be accounted for. As was observed by a very practical man, it should be recollected that the general standard of excellence had been very much raised during the last twenty years; that twenty years ago they saw tremendous mountains of fat, but they did not see the classes generally so well represented as they had been since. He thought there was a great deal of truth in that. A vast obese creature could not now be considered a good animal. The good sense of the community had led farmers to try and produce meat of good quality, which the public could readily consume, instead of an enormous mountain of fat. This appeared to him to account in a great degree for the fact that the standard of excellence was not now so high as it had been. The classes generally were better represented than formerly; and although there might not be extraordinary animals, yet the explanation was that very extraordinary animals were not produced every year. In conclusion, he would observe that in his opinion the country at large was much indebted to the Smithfield Club for the encouragement which it gave to the production of the best breeds of animals (Hear, hear).

Mr. BUCKLEY, with whose name the toast was associated after retaining thanks, said, having perhaps had greater opportunities than almost any person present of judging of the character of this year's show, inasmuch as he spent the greater part of Monday morning in judging, he must declare that in his opinion the show was nothing like as good as those of some previous years. There were more common animals than usual; and when the stock was taken from the stall to the open, it would be seen that on the whole it was not nearly so good as what had been exhibited before. To what cause this was to be attributed, whether it was owing to the demand for bulls abroad, or whether it was that the best oxen were not to be found in the country, he could not say, but the animals were certainly not equal to those of the last three or four years. Having taken particular notice, he said confidently that, generally speaking, the stock had not come up to what they had seen at the show for the last few years (Hear, hear).

Mr. R. MARSH proposed "The Local Farmers' Clubs." There were, he observed, two or three subjects to which he thought those clubs would do well to direct their attention. One had already been referred to, namely, the malt-tax. They ought to make a combined appeal to the Chancellor of the Exchequer; and if this were done, and farmers made a united effort, that iniquitous tax would, he believed, be abolished. Another matter deserving their attention was the importation of diseased cattle—an evil which should at once be put a stop to; and a third was the evils connected with the sale of wool. Thanks to Messrs. Bradbury and Cook something useful had been done already with regard to the last-mentioned matter, and he hoped that if a general attack were made on the old system, it would soon be abolished.

Mr. SPOONER, of the Botley (Hants) Farmers' Club, in replying, said he presumed the reason why he had been selected for that purpose was, that he represented one of the oldest farmers' clubs in the kingdom. A short time ago the subject of the malt tax engaged their attention; and they were unanimous in favour of its repeal. He hoped that, in seeking the abolition of that impost, agriculturists would not rely on any one ground of opposition to it; for that would be unsafe. It would be far better, he thought, to rest their case on general grounds. It was impossible to have a stronger argument than that the agriculturist must, both as a producer and a consumer, derive great advantage from the repeal or reduction of the malt tax; and he held that it would be much safer to rely on that main argument than on what seemed almost to have been put forth as a trap, to induce agriculturists to rest their case on the value of malt for feeding purposes (Hear, hear). Another subject which the club he represented had had under its attention was what had elsewhere been called "Stock versus corn," but they had not been able to see any *versus* in the case (Hear, hear). They had found, from the experience of their members, that stock and corn were so closely connected together, that it was impossible to separate them, and that, in proportion as stock were fatted, corn would be abundant on the farm. It must often have been observed that when cattle were the subject of discussion, corn was sure to be continually cropping up (Hear, hear). While speaking on this subject he would express an opinion, which he was sure would be endorsed by the majority of agriculturists, that if high feeding had destroyed its hundreds, low feeding had destroyed its thousands and tens of thousands. He spoke advisedly when he said that more than half the diseases of cattle were produced, directly or indirectly, by under-feeding. As regarded the toast to which he responded, he must say it was gratifying to the local clubs to find that the Central Club, located in the heart of the kingdom, had, in the twentieth year of its existence, sufficient vital warmth to influence the extremities beneficially, and that it gave to the representatives of local clubs, on occasions like that, such a warm and cordial welcome. Before sitting down he had to propose, as he did with very great pleasure, the toast of "The Committee of Management." If the committee previously deserved the thanks of the members, they did so now all the more for their efforts to procure suitable premises for the Club, and as Mr. Wm. Cheffins had rendered special assistance in the development of the plan to which he alluded, that gentleman's name would be coupled with the toast (cheers).

Mr. CHEFFINS, in responding, observed that the list of subjects for discussion next year would be very interesting, and that he hoped that a twelvemonth hence the committee would have the pleasure of welcoming the members to their rooms in the new hotel. In proposing the health of their excellent secretary, Mr. Corbet, he was happy to bear testimony to the cordial and valuable co-operation which the committee had ever received from him (cheers). It was in fact, in a very great degree, owing to that gentleman's zeal and efforts that success had attended the Club (cheers).

Mr. CORBET, in retaining thanks, said he considered that every speech which had been made that evening on the satisfactory position of the Club was a complement to the management (laughter). It had been his endeavour to carry out the wishes of the committee as far as possible, and he was glad to find that his conduct had met with approval (cheers).

The CHAIRMAN then proposed the concluding toast of "The Visitors;" and after this had been disposed of, the company separated.

STEAM CULTIVATION.

MEETING AT ST. JAMES'S HALL.

A public meeting was held, on the Wednesday afternoon in the Smithfield Show week, at St. James's Hall, for the purpose of considering the best mode of extending the application of steam-power to the cultivation of the soil. The attendance, which was over 200, included a large number of land-owners and farmers. The chair was taken by Mr. E. Holland, M.P.

The CHAIRMAN, after stating that the object of the meeting was the extension of steam cultivation throughout the land, proceeded as follows: We all know, at least I do, what are the difficulties of starting steam cultivation on a farm. But after it has been once started, and after the land has been for two years under such a system, we all know how we are repaid for the capital employed in the machinery necessary for the purpose, and for the trouble and labour we have gone through (Hear). The advantages are so palpable that I need hardly mention them here, except as they lead up to what we are about to propose to you this day. In steam cultivation we must not commence without having thoroughly drained our land (Hear, hear). And one of the causes which has conducted us to the adoption of steam culture is that our lands became perfectly drained: that is a *sine quâ non*. After we have once commenced operations, we know, more especially upon our heavy clay lands, the great advantages arising from the absence of the pressure of horses. Under the old system, in consequence of that pressure the subsoil was so continually made into a species of brick beneath the apparently well-tilled surface that the roots and crops had no chance, and upon the heavy clay lands the horses did almost as much to the detriment of the cultivator as they did to his advantage. Now all that is avoided by the system of cultivation by steam. With regard to the number of horses employed, in my own case I had at one time twenty working horses under the old system, and I have now reduced that number to twelve after four years' cultivation by steam (Hear, hear). I do not mean to say that anyone going over my farm will not find as many horses now as there were formerly, but he will find young horses instead of old ones. The young horses have come into play for the lighter work which the steam plough has left to be done, and they have always a marketable value, like sheep or cattle, or anything sold from the farm. But amongst other advantages arising from steam cultivation is this, that it enables us to effect in a week or a fortnight in the autumn that which under the horse system would have taken six weeks to perform (Hear, hear). The consequence is that we obtain really a command over the seasons, and all who know anything about the value of autumn cultivation upon heavy clay lands must see that that in itself is an advantage that would pay for the use of the steam plough. In fact, on clay lands a complete revolution has been effected through the establishment of steam cultivation; and whereas before land was unproductive because it could not be cultivated deep enough, and the pressure of horses did so much damage upon it; now, under steam cultivation, land which had only been semiproductive is really and truly becoming a kitchen garden. And these advantages are gained, shall I say at a greater cost? Not so. In my own case, I find it to be one-half the cost of ploughing by horses. Whereas I used to plough with four horses at a cost of 20s. per acre, I now plough by steam at a cost, including wear and tear, of 10s. per acre, and cultivate by steam at a cost of 5s. or 6s. an acre. After having been four years in operation—and I am now engaged in thrashing out my fifth crop—I think I may say that, so far as my experience goes, the average additional produce per acre is about one quarter, or eight bushels; that is, under the influence of steam power *versus* horse labour (cheers). That being the case—and I am sure I am right with regard to the heavy clay lands of Gloucestershire, even taking wheat at 5s. a bushel, that is £2 in a acre; so that there you have the rental of the land paid entirely by the use of the steam

plough. With all these great advantages arising from the system then, how is it that it has not been more generally adopted all over the country? One reason is, that landlords are not yet satisfied as to the great merits of steam ploughing, and consequently still keep to their small fields, and will not allow the numerous hedgerows to be removed. Still, that is not an objection that will stop the enterprising farmer; the objection with him being the amount of capital that is required to start a steam plough. In my own case, with Fowler's tackle and harrows, I consider that I have capital invested in steam ploughing to the amount of £1,000. If you were to adopt the cheaper, though excellent, process of Howard's or Smith's, you would do it for about £100 less. Nevertheless, before the tenant farmer could gain the advantages of steam cultivation he would be obliged to invest a capital of several hundred pounds; and I hope the day may soon come when it will be a common thing for the tenant farmer to have a few hundreds in hand to expend in the way that he may think most profitable in connection with his trade (Hear, hear). But it is not a common thing yet, and that is no doubt the chief obstacle to the extension of steam cultivation. How, then, is this difficulty to be overcome? It has been attempted in different ways. In some instances enterprising tenant farmers, who have their farms lying contiguous to one another, have united, and started a steam ploughing machine between them. But there are some disadvantages about that, and they are, that when each takes it in turn to employ the plough, each is anxious to have it first; for, being situated in the same climate, and perhaps on the same description of soil, they all wish to be ploughing at the same time; and that when each in turn takes this joint-stock plough and machinery he has to employ the people who are upon his own farm, and these are not always men who are qualified for the management of a steam engine and tackle. The consequence is, as engineers will tell you, that in such cases there is immense wear and tear, and that the damage done to the engine and machinery, and sometimes to the plough, is very great, and makes steam ploughing a far more expensive process than otherwise it would be. (Hear, hear). Another mode of proceeding, which has been adopted in my part of the country, is the establishment of a company for the purpose of letting out ploughs. Now, it is all well and good where such companies have been called into existence, if they have been put under the care of engineers, or persons connected with engineering establishments; because during the ploughing season, men who have the management of the plough are hard at work in steam cultivation, and when the ploughing season is at an end, and cultivation ceases, and the plough lies idle, they go back to the engineer's office, and are set to work in another department of the establishment, instead of having to be supported doing nothing, as they must be where the company is engaged simply in steam cultivation. In short, the staff had not to be maintained, as it must be in the case of a purely steam cultivation company—a most expensive process (Hear, hear). These two plans, then, that of tenants working and having a steam-plough between them, and that of forming a company, unless it was placed under the control of an engineering firm, being deemed altogether unsatisfactory, it has been considered advisable to start a Steam Cultivation Company, for the purpose of supplying engines, ploughs, and other agricultural implements to the tenant-farmer; and it is for the purpose of ascertaining what are the opinions of the agricultural world upon this subject that you are called together on the present occasion. As far as I am concerned, I can only say that I look upon the formation of such a company as a measure calculated to be of very great service to the agricultural world (cheers). A prospectus which I hold in my hand thus sets forth the objects which the company would have in view. They would provide

es,ial for the purchase of steam cultivators and other approved implements, receiving one-fourth of the value of the machinery within three months of the date of the agreement, and the remainder in instalments extending over a period of three, five, or seven years; thus, in effect, becoming a loan company to the agriculturist. It is also stated that the farmer who may desire to buy machinery through the agency of this company, will, to a great extent, be at liberty to choose his own system and implement maker. The shareholders, on the other hand, are free from risk, since the company order only after they have sold. They are not called upon to venture a shilling in agricultural steam machinery; they are merely the intermediaries who pay the implement maker for goods supplied, and have their outlay returned, with interest, by instalments. Now, I have taken shares in this company, but it is more as an advocate of agricultural progress than of the company that I appear before you to-day. I wish the company well, and that it may be a successful undertaking. At the same time I am certain of this, that, whether it be successful or not, the advantages of establishing such a company would be very great to the agricultural world (cheers).

Lord R. MONTAGU, M.P., said, that when he was invited to take charge of the first resolution, it occurred to him that any one present who knew that he was neither a farmer nor a shareholder, nor otherwise connected with the company, might fairly put the question what business he had on the platform. Before proceeding further, he would at once answer that question by anticipation. It was very true that he used to think nothing of these steam ploughs, not knowing their value or performances; but last summer he went down to Huntingdonshire, and there saw one of Fowler's steam-ploughs in full work, and he owned that he was amazed to see the plough rising up and down the field and ploughing furrows twice as deep as those which were ploughed by horses by dint of slow and laborious toil. It occurred to him that it must be of the greatest advantage to the country if the use of steam cultivation could be made more general (Hear, hear). The first thought that struck him was that the agricultural societies of the different counties ought to take the matter in hand, purchase engines and machinery, and let them out to their members. But he found that these societies had not funds at their disposal. Besides, said they, every member would be wanting the steam-engine at the same moment, and we could not arrange that, therefore it must be taken up by private enterprise. He might be asked what were the advantages that would result from the extensive use of steam-cultivation? To which he would reply that it seemed to him they were exactly the same as those that would accrue from a good harvest, supposing its advantages were rendered permanent. Take, for instance, the present year. There had been a good harvest; he understood that it was 40 per cent. better than usual. Let them consider the result of that. Every year until this we had imported vast quantities of corn and other grain from other countries. In the year 1861 we imported not less than sixteen million qrs. of corn, wheat, flour, and meal. Putting that at an average of 40s. a qr., it represented the enormous sum of £32,000,000 sterling, all of which we paid away into the hands of the farmers of other countries. So many millions went to the farmers of the United States of America, so many millions to Prussia, and so many millions to Poland and the Danubian Principalities. Now, if we had not this large quantity of corn to import, which happened to be the case this year—and it had been stated that, owing to the goodness of the harvest, the country had already saved £10,000,000 sterling, and yet more would be saved before the year was ended, for Mr. Caird, a high authority on the subject, when speaking to his constituents, had told them that this year, according to his calculations, £20,000,000 would be saved by the good harvest—and if we could render that saving permanent by steam cultivation, observe the advantages that the country would gain. In the first place, the £20,000,000 which went to America, Germany, and other places, would go into the pockets of the British farmers. That was the first and direct advantage. But there was a subsidiary advantage. The whole of the 16 million qrs. of corn which were imported came here in ships. It took one million tons of shipping to bring over five million qrs. of corn. Supposing, therefore, we this year imported only five million qrs., we should thereby set free two million tons of shipping (Hear, hear). Conse-

quently, the cost of freight would be reduced; and that would reduce the cost of every article that was imported from other countries (Hear, hear). That was a second advantage. So that the British farmer would not only have £20,000,000 of money more in his pocket, but that £20,000,000 more would be circulating in England, at the same time that every article imported from abroad would be cheaper (Hear, hear). In the next place, let them consider how it was that the foreign farmer could compete so successfully with the British farmer? It was because the foreign farmer could grow his corn so much cheaper than the British farmer, that he could afford to pay for its freightage to England and yet undersell the native producer in his own market. If, then, the British farmer were enabled to grow his corn at a much cheaper cost, it was obvious that foreign competitors must be driven away. Not only that, but if the cost of cultivation were materially reduced, it would pay to take in many of those waste-lands which were not now farmed, and if farmed would not pay for the tillage (Hear, hear). If cultivation could be carried on much cheaper, such lands would then pay for tillage, and we should find that considerably larger breadths of land would be placed under cultivation. These were the three advantages which in his opinion would ensue from steam cultivation. But these advantages must depend on two propositions—first, that the cost of steam-cultivation was much lower than that of horse-tillage; and, secondly, that the produce of steam-cultivation was much greater than the produce of horse-tillage. Upon that, there can be no doubt, the whole matter turned (Hear, hear). They had heard what the hon. gentleman in the chair had stated. He was a man of great experience. He had farmed with steam-engines four or five years; so that he could tell them of facts which had come within his own knowledge and observation. Unfortunately, he himself could not do so; but, lest he might be thought to shirk this question, he would mention two facts that had come under the notice of everybody. A short time ago a farmer of great repute (Mr. Smith of Woolston) published a letter in which he gave the details of the cost of steam cultivation compared with the items of the cost of horse-cultivation; and the result he arrived at was, that steam cultivation came to not quite 10s. an acre, whilst the expense of horse culture was 15s. 4d. an acre. Then, with regard to the amount of produce, Mr. Smith stated that on his land—it was a heavy clay farm—he had never been able before with horse tillage to raise as much as 40 bushels of barley per acre; but that since adopting steam cultivation the same field had given him this year a produce of 61 bushels an acre, and his seven years' average of wheat had been fully 8 bushels more than before. Now that agreed with the statement of the Chairman. He at least supported these two facts, not only that horse tillage cost half as much again as steam cultivation, but also that they got from steam cultivation half as much more produce. They had no doubt all seen a pamphlet written by Mr. Hutchinson, and entitled "Water and Fire against Corn and Hay." In that pamphlet Mr. Hutchinson stated the experience of a farm, belonging to Lord Brownlow, in Berkshire, which was so bad and in such disreputable order that no occupier could be found for it at 25s. an acre. The result was that it passed into the hands of the landlord himself, who, having bought a ten-horse power steam engine and a £5 cultivator, set them to work to cultivate this heavy clay farm. Mr. Hutchinson gave a detailed account of the whole matter, and came to pretty much the same conclusion as Mr. Smith, of Woolston; for he made the cost of steam cultivation 7s. 2d. an acre, which was a little less than Mr. Smith's, whilst the cost of horse culture was 15s. 4d. The results were near enough to make them identical, though Mr. Hutchinson's were somewhat more advantageous than Mr. Smith's. With regard to the increase of produce, Mr. Hutchinson said that the farm was 546 acres, and that the value of the increased produce—not the aggregate produce, but the increased produce over and above that which it had been in former years—amounted to £776. The rent of the farm when this took place was £678; consequently the increased produce alone was more than sufficient to pay the rent, whilst all that had been spent on horse cultivation in former years was set free for improvements (Hear, hear). If these things were true—and they were not denied or controverted—surely we must acknowledge

that steam cultivation was far cheaper than horse tillage, and that its produce was far greater (cheers). Let them, then, consider the immense advantages of substituting as far as possible the one system for the other. Supposing they could increase the produce of England, Ireland, and Scotland, by one-half, and so render it cheaper, look at the effect, not only on the British farmer, but on the condition of England as a nation. At the present moment we were tied and bound down to other countries for our supplies of grain. When they were in prosperity we participated in their prosperity; and, when they were in adversity, we were chained down to their adversity (Hear, hear). This year we had enjoyed a good harvest, and had not felt what we should otherwise have done. But consider what would have happened if we had had a bad harvest—if other countries were in the same predicament, and little or no corn could be obtained from America, Prussia, Poland, or the Danube. What, then, should we have done? Why, a dearth of corn would be much worse than a dearth of cotton (Hear, hear). People may subsist without cotton, but they cannot without corn (cheers). Therefore, he held that it was a matter of national importance that something should be done to render the advantages of a good harvest permanent (cheers). He begged to move, as a corollary to these remarks, "That the cultivation of the land by steam is now proved to be an advantageous and highly economical process, and that the machinery now used for this purpose is of a character sufficiently perfect to be recommended for the use of practical farmers."

Mr. JAMES WILLIAMS (North Court, Abingdon) seconded the resolution. He said the cultivation of land by steam was no longer a problematical idea, but a great fact. It was spreading through the country in various directions; and that its spread was not more rapid arose chiefly from the isolated position of farmers, which tended to confirm their prejudices in favour of old-established systems. The age in which they lived was one of great improvement; but farmers, owing to their scattered position, had not the same facilities for improvement as other classes of society. The advantages resulting from the employment of steam in the cultivation of the land were three-fold. In the first place, land could be cultivated more cheaply by steam than by manual or animal power. One great cause of this was that it was cultivated much more deeply by steam. At certain periods it was impossible to cultivate tenacious soils six or eight inches deep by horse power, while they could be easily cultivated by steam. Moreover, there was statistical proof before the country of the comparative cheapness of steam power. Secondly, steam was more efficient than horse power. In the one case the soil was always turned over so as to be ready for the water to percolate and the air to permeate; in the other there was often more harm done than good. By steam the land was cultivated to such a nicety that, unlike the case of land ploughed by horses, the fine soil was brought to the surface while the subsoil remained untouched, the land still retaining all the advantages connected with winter, and affording an excellent prospect as respected the root and grain crops. Thirdly, the steam plough could be used just when and as much as they wanted to use it. There was of course a point beyond which it would be wrong to tax the strength of an animal; but in the case of steam there was no such limitation. In the dry season the land could be stirred just when they wanted to stir it, and once done the work was in the strict sense of the words doubly done (cheers). Again, what was the chief value of manure? Was it not that by operating on the fine particles it made the soil in a fit state to impart to the plant the nourishment which it required? That object was attained much better by steam than by horse power. Under these circumstances, it might be asked, how it was that steam was not used by farmers generally? There were several causes for it. Farmers had got their horses and their ploughs, and hesitated to substitute for them something new, lest something better should be produced. A still stronger reason, however, was hesitation about the capital required for the use of steam power. When he heard of an implement costing from £600 to £800 he began to look at the balance-sheet of the last two years, and to consider whether, with wheat at 40s. a quarter, he could afford such an expenditure. He might add to this, that farmers were by habit very fond of making bargains, and did not like to pay whatever was demanded—a peculiarity which was met by the company that was now being formed.

As regarded the results of steam cultivation, he could corroborate all that was said by the chairman from his own experience in farming. He had tested the matter by a comparison of crops grown with steam cultivation and crops grown with horse tillage. In the former case the spring crops, barley and oats, were very far superior to those produced by horse power. He entertained no doubt whatever that in a few years the cultivation of the land by steam would be as general as thrashing by steam (cheers).

Mr. BRAVIS (a tenant farmer) inquired what was the smallest field, irrespective of the size of the farm, in which steam cultivation could be carried on with profit.

Mr. WILLIAMS replied that none were too small for the purpose. A field of four acres, if square, could be cultivated profitably by steam.

Mr. BROOKE was not satisfied with regard to the economy of steam cultivation. It was no doubt a great benefit to save the land from being trodden by the horses, but they might be buying that advantage too dear. He was a landowner in Suffolk, and he had tried the application of steam to thrashing, but had found the expense greater than the receipts to defray those expenses. If the steam cultivator broke down it had perhaps to be carried a long way to be repaired, and then a month might be lost while it was at the machine maker's. Except upon very large farms he did not think that horse labour could be superseded by steam.

A GENTLEMAN from the North of Ireland expressed his hope that a movement of such national importance would succeed in spite of some minor objections and early failures.

The resolution was passed unanimously.

The Earl of SUFFOLK and BERKSHIRE moved the second resolution, viz.: "That one great obstacle to the progress of steam-culture is the inability of the generality of tenant-farmers to purchase the expensive machinery now used to break up and prepare the soil." He said, although he had never tried a steam-plough himself, he had seen one working successfully in the cultivation of a farm; he did not think it answered so well in that case for draining. As regarded the gentleman who spoke of his loss by his thrashing-machine, he could not help remarking that what he said was strongly in favour of the formation of the Steam Cultivation Company, which would enable farmers to obtain the use of steam-ploughs on the best terms. It would be better to hire a thrashing-machine than to go back to the old sail. He would recommend agriculturists to take shares in this new company, which would bring steam power within the reach of farmers generally. As to the superior cheapness of steam-power, a farmer had told him that he had his land ploughed for him last year for 10s. or 10s. 6d. per acre, and this year for 12s., and that he could not have done it by horse-power under £1; so that there was a saving of 8s. an acre (Hear, hear).

Sir HENRY VAVASOUR, in seconding the motion, said: "The cultivation of the soil by steam power has been long anxiously looked forward to; but few of its most sanguine advocates, I believe, expected to see the rapid improvements that have been made in the implements brought out (Hear hear). The change in the economy of a farm by the use of steam as a motive power, from the first operation to the last, is one fraught with such extraordinary advantages that I cannot but express the deep gratitude I feel in being permitted to witness even the dawn of such a revolution. Entertaining this opinion of the value of steam cultivation, I have been surprised that a Company formed for its extension has as yet met with less encouragement than the magnitude of the interest involved should command. It must, I think, arise from the fact of capitalists, if not agriculturists also, not having fully realized the advantages offered. History, however, teaches us that the agricultural portion of communities has ever been backward in receiving impressions (Hear, hear). Mr. Grote, in his excellent History of Greece, speaking of Arcadia at an early period, states this clearly. He observes: "The ancient philosophers and legislators were deeply impressed with the contrast between an inland and maritime city. In the former, simplicity and uniformity of life, tenacity of ancient habits and dislike of what is new or foreign, great force of exclusive sympathy, and narrow range both of objects and ideas; in the latter, variety and novelty of sensations, expansive imagination, toleration, and occasional preference for extraneous customs, greater activity of the individual, and corresponding

instability of the state." (Hear, hear.) If for the word "maritime" we substitute Manchester, Birmingham, and our large towns, the comparison drawn will be found applicable to the disparity existing in our own country, between the agricultural interests on the one hand, and the commercial and manufacturing on the other (Hear, hear). The fact of owners and occupiers of land living, in a great measure, in a state of isolation, the absence of societies analogous to mechanics' institutes, of schools and public lectures, and, above, all the want of provincial libraries and a supply of books, ever wanted but never to be had, may be one cause of our continuing to occupy a secondary position (Hear, hear). A stranger visiting London this week might perhaps be led to conclude that the exhibition of gigantic beavers, symmetrical sheep, and bulky roes, represented the ordinary farming of the country in a greater degree than we know to be the case. It does so neither more nor less than the parsnip in our garden represents the same plant we eradicate from our fields (Hear, hear). The exhibitors are the Senior Wranglers amongst us (Hear, hear). In the presence of some of the farmers of England, of whom we are most proud, I may venture to say that a large area of land in many of the English and Welsh counties is still very indifferently farmed, for although England may be the richest country in the world, the precious metals do not generally abound in the rural districts. The great problem in every household, as in every state, has ever been, By what means can expenses be reduced and receipts increased? To the agricultural world the introduction of steam cultivation offers a solution of this problem to a greater extent probably than the application of any invention hitherto known, for the advantages resulting from its use are two-fold: firstly, the annual working expenses are diminished; secondly, the produce is increased (Hear, hear). If any person be sceptical upon this point, let him plough or cultivate alternate strips, of three or four feet in width, by steam and horse-power, sowing the whole with any ordinary crop. He will find in the spring and summer two lines as distinctly defined as lines ruled upon a slate or colours in a ribbon border—the one a dark green, the yield of the crop being represented by, say, the figure 4; the other a pale, dubious green, inclining to yellow, the return to the ledger fully expressed by the figure 3 (Hear, hear). In calling upon you for your support of and co-operation with a society having for its object the general application of steam-power throughout the length and breadth of the land, we are not asking you to invest your capital in a toy or untried implement, but to take advantage of the scientific knowledge of the age, and thereby benefit yourselves, your neighbours, and your fellow-countrymen (cheers). I have the honour to second the resolution.

Mr. BEAVIS believed that a great deal was to be accomplished from the employment of steam tackle for ploughing. He doubted whether farmers, though an isolated class, were more backward than manufacturers in adopting anything that was for the good of their pockets (laughter). He should be glad himself to have the opportunity of hiring a steam plough, if it could do the work at 10s. an acre.

Mr. DAVISON, of Horley, Surrey, said he believed nothing would be done in the matter unless farmers themselves took it up. Probably there was no one in that room who did not feel that steam was, in reference to cultivation, the great moving power (Hear, hear); but farmers must exert themselves, put their hands in their pockets, and not rely upon others. He trusted they would come forward in great numbers to support this company. The man who did not employ steam could not expect to compete, in future, with those who did (Hear, hear).

In reply to a question from a gentleman who said he came from Australia,

The CHAIRMAN said the steam plough could be employed upon hilly and undulating ground without any difficulty whatever.

The resolution was then put and carried.

Mr. HARRISON, of Gloucestershire, proposed the following resolution—"That considerable advantage would arise to tenant-farmers and others from the establishment of a joint-stock company for the purpose of supplying steam apparatus to applicants, allowing them to repay the cost price by instalments extending over a certain number of years, on the principle of a rolling stock company." In his opinion the purchase should be made by the landlord and tenant in conjunction, the company taking a bond from the landlord for the payment of

the money. As a farmer he had had a little experience of steam ploughing already, and he knew the great disadvantage to a farmer of having to wait for his turn to have his land cultivated by steam. He sometimes missed his opportunity, and when he did get the steam plough he almost wished it away. Hence he considered that it would be a great benefit to farmers to have steam cultivating apparatus of their own (Hear, hear). Their experience of steam ploughing in Gloucestershire clearly showed that it was not desirable for any company to undertake ploughing by hire. It was essential to the owners of an undertaking like that under consideration that there should be good security, and such security could be obtained through the landlord and the tenant acting in conjunction. Under the proposed plan the company could supply the steam cultivator, and the tenant would pay the cost by instalments, and a certain amount for interest; and the company would have an additional security in a bond from the landlord that the money should be paid. Let them observe the advantages of this scheme. When the machinery was first supplied, the landlord's responsibility was at the maximum; but the engine was new and in first-rate condition. Year after year, as the tenant continued paying off, the amount of his interest increased, while the landlord's responsibility diminished. The Company still retained its security; and in the event of the tenant's refusing or becoming unable to continue the payments, the landlord would meet them, and at the end of the period the cultivator would be his. He thought that was the only way to obtain proper security; nor was it at all unreasonable, in his opinion, to ask landlords to incur a responsibility for what would conduce to their benefit as well as to that of the tenant.

The Earl of SUFFOLK and BARKSHAM observed that under that system a landowner might have half-a-dozen steam ploughs left on his hands.

Mr. HARRISON replied, that in that case he would have half-a-dozen farms to be cultivated (Hear, hear). He knew a recent case in which a farm had to be let, on which there was a steam plough, and one of the conditions was that the new tenant should take to that plough. There were a great number of applicants for the farm, and so far from the condition just mentioned being objected to by them, it was considered an advantage that the future tenant would obtain a steam plough on the farm (Hear, hear).

Dr. VOULCKER, in seconding the resolution, said the farmers of England were frequently spoken of as a prejudiced, ignorant, and slow race of men. It was not for him to say whether they were more so than other classes of the community. All had their prejudices, and all were more or less ignorant (Hear, hear), and if one class were a little quicker than another, the quicker was not always the surer (Hear, hear). Farmers, as a class, perhaps no one would deny, were slow; but their very slowness was a recommendation; for, if they were not slow, they could not be good farmers. But, if slow, they were sure (Hear, hear). He believed that the carrying out of the resolution just proposed would be of immense advantage to agriculture. He thought there should be not only one joint-stock company of this kind, but a number of them scattered all over the country (cheers). What made a man engaged in manufactures or commerce enterprising was the command of surplus capital. Farmers, as a body, were not in that position: they really had to turn a penny twice before they could with comfort to themselves spend it: and it was very reasonable that a farmer should think twice before spending a large sum on an implement of which he had perhaps had little general observation, and no personal experience. Now, it was to meet this case, as he understood, that joint-stock companies were to be established, and he had no doubt that farmers would largely avail themselves of the opportunity of repaying by instalments the money advanced by capitalists. But he felt that he was somewhat out of place in speaking on such a purely practical question, and he would therefore, as a scientific man, addressing, as he did a large influential meeting, proceed to mention two points with which the discussions which took place on the advantages of steam cultivation did not appear to him to have been made sufficiently prominent. They were, first, that by steam cultivation you could get from many soils an immense quantity of manure, and thus save a good deal of money in the purchase of artificial or the purchase of home-made manure—a very important advantage (Hear, hear); secondly, that there were many soils in this country which were really not

in a fit condition to receive artificial manure, if the farmer were willing to purchase it—for example, guano or superphosphate of lime, or even farmyard manure. This second point was one of great practical importance. They frequently heard of clay land which was so poor that it would not repay the cost of cultivation; and it would be well to inquire what was the cause of that poverty. Land of that kind might be poor for one or two reasons—either because it had not the elements of fertility in it, or because it was not in a fit condition to receive manure. In either case something should be done to bring the soil into a better condition. To do this by manual labour was out of the question, and to do it by horse labour was in many cases, as he had no hesitation in saying, impossible. The only mode of effecting this object, in some parts of England, was, happily, steam power. What would be the result of steam cultivation? In places where there was, so to speak, an immense amount of capital locked up in the soil, that capital would be set free; in other words, steam cultivation would eliminate from the soil itself the elements of manuring fertility which were purchased so dearly in guano and manufactured manures (Hear, hear). All who knew anything of his writings must know that he was a great advocate for every description of manure in its proper place. He called applications of manure out of place when they had the elements of fertility in the soil, and when for want of proper energy or proper implements they did not avail themselves of steam cultivation to work out of the land the materials they required. This was a point which had not been sufficiently attended to by writers on steam cultivation, and he wished therefore strongly to impress on the meeting that from nine-tenths of the soils of a heavy description they would get by steam cultivation an immense amount of fertilising matter (Hear, hear). Few persons had any adequate idea of the enormous resources of clay soils. Some time ago he examined some clay soils in Gloucestershire, and for his own amusement he made a calculation with regard to their constituents. He found that in the clay soils there was, within a depth of an inch and a-half, a sufficient amount of that very important element potash to supply the wheat crops for 1,500 years, and that farmers had only to go down another inch and a-half to get enough potash for 1,500 years more. There were many poor clay lands, and if they were cultivated by steam would for a long succession of years yield large crops, without the farmers being compelled to make large purchases of guano or other artificial manures. In the next place he would observe that many soils were not in a fit condition to receive manures; they were bad clays, or so tenacious that if manure were applied to them it ran off the surface. When rain fell, the most valuable portion of the manure was washed out; the essence of the manure ran in the readiest way through the cracks of the clay, instead of filtering through the soil. By steam cultivation the mechanical condition of the soil, and therefore its fitness to receive manure, would be greatly improved. In whatever light clays were regarded, steam cultivation could not but produce wonderful effects; and he believed that what they now witnessed was merely a foretaste of what was to be expected from steam cultivation, and what would be seen twenty years hence (cheers).

A GENTLEMAN, speaking from the centre of the room, and who announced himself as the owner of sugar estates in the West Indies, spoke of the success with which steam cultivation had been introduced into Demerara, Barbadoes, and Antigua, but urged that attention should be turned to simplifying the machinery, and thus reducing its cost.

The resolution was then adopted.

SIR GEORGE JENKINSON moved the following resolution: "That this meeting views with decided approbation the objects of the General Steam Cultivation Company, and the mode in which it is designed to carry them into effect." He said that resolution was a very practical one, raising, as it did, the question whether the scheme of forming a company should succeed or should fall to the ground. With a view of showing clearly the principal features of the scheme, he would read what they proposed to make the base of their proceedings: "Since steam will enable the farmer to cultivate with fewer horses, since it improves the quality and increases the produce of his land, since it makes him almost independent of the

weather, by doing his work with marvellous expedition and precision, the progress of steam cultivation must mean more profitable farming and more abundant food. The majority of farmers who use steam bear enthusiastic testimony to its superiority over horse-power. With the public, the use of steam applied to agriculture is a question of the very greatest importance, since it means a large increase of the stock of home-produced food for the people. That there is room for the most profitable investment of a large capital in steam agriculture, is proved by a calculation published in the leading article of the *Agricultural Gazette* of July, 1861, where it is shown that in the cultivation of the land there is full scope for the employment of 15,000 engines of twelve-horse power each. The farmer who may desire to buy machinery through the agency of this company, will, to a great extent, be at liberty to choose his own system and implement maker. The shareholders, on the other hand, are free from risk, since the company order only after they have sold. They are not called upon to venture a shilling in agricultural steam machinery; they are merely the intermediaries who pay the implement maker for goods supplied, and have their outlay returned, with interest, by instalments. They have undoubted security for their invested capital, for while the company receive in ready money 25 per cent., and when the first year's quarterly instalments have been paid, hold a total cash security equal in no case to less than 33 per cent. of the retail value, they retain the legal ownership of the machinery—to them an always available security until the price of it has been completely reimbursed to them. The rate at which the capital is repaid to the company will always, even under the seven-years' scale, maintain the amount in their hands at a sum far beyond any possible amount of depreciation which the machinery might suffer from neglect; but the purchaser will, nevertheless, be bound to keep the machinery in an effectual state of repair, and to the satisfaction of the company's engineer; which, indeed, it will obviously be to his own interest to do." Three objections were raised against steam cultivation. The first was the expense it involved. That objection would be entirely met by the company, inasmuch as the tenant-farmer would not be called upon to lay out any money to obtain a steam cultivator. The second objection was the trouble or annoyance which might be caused to landlords by requiring them to alter the shape of their fields, and to remove their fences. If a landowner improved his farms to the extent necessary for steam-draining and cultivation, the enhanced value of the land would be ample compensation for his trouble. He would be able to obtain a better class of tenants, because the land would yield a greater amount of produce, and carry more stock. The last objection to steam cultivation was that it would interfere with hunting. Even if that would be the case, it should be remembered that hunting was not everything (Hear, hear), and that it must, if necessary, give way to the production of increased food for the population. But as one who hunted himself, he contended that that objection was unfounded. Every huntsman knew what it was to ride over a heavy clay, having a high fence at the end of it, on a blown horse; and if clay land were well drained and in a sound condition, undoubtedly less injury would be done to it by the treading of horses than was done while it was undrained and almost in a state of nature, and the horse's hoofs made pits for water. Viewing the question as a sportsman, as well as a landlord, he thought there was no force in the objection with regard to hunting. In conclusion, he would remark that scarcely anything great or important could be achieved without some sacrifice at the outset; and even if a landlord did lose a few hundred pounds by making himself responsible in the manner now proposed, he would ultimately reap advantage in the improved state of his land, and in securing better tenants (Hear, hear).

MR. H. WILLIAMS seconded the resolution.

MR. HUTCHINSON, in supporting it, adduced his own experience as a farmer in steam cultivation, to show that it is far more economical than horse cultivation.

The resolution having been adopted, a vote of thanks to the Chairman followed, and the proceedings, which had occupied about three hours, terminated.

THE SMITHFIELD CLUB SHOW.

THE LIVE STOCK.

So far as the mere number of entries could make a good Show, there is every reason to be gratified with this second great week in the Graziers' Palace. The cattle classes give 245 entries—an increase of 64 over last year. The pigs, too, number 56 entries, or 4 more than last year; but the sheep fall off, there being only 154 pens, or 32 fewer than at the Show of last December. The quality, however, is by no means so good, and there is no question but the catalogue numbered up the most moderate lot of beasts brought together for some years past. In fact, as Mr. Buckley, one of the judges, said at the Farmers' Club dinner: "Having perhaps had greater opportunities than almost any person present of judging of the character of this year's show, inasmuch as he spent the greater part of Monday morning in judging, he must declare that in his opinion it was nothing like as good as those of some previous years. There were more common animals than usual; and when the stock was taken from the stall to the open, it would be seen that on the whole it was not nearly so good as what had been exhibited before. To what cause this was to be attributed, whether it was owing to the demand for bulls abroad, or whether it was that the best oxen were not to be found in the country, he could not say, but the animals were certainly not equal to those of the last three or four years."

The DEVONS about equal their last year's appearance, as far as numbers are concerned. At Birmingham there was some unusually good competition in the male classes; but here we have winners that would not run the risk of a journey last week, and saved up their condition for triumph at Islington. Mr. Robert Wortley's first prize steer, bred from the herds of Mr. Hole and Mr. Quartly, is remarkable for size and weight, very great at 2 years and 7 months old, and possessing also the characteristic of a good Devon. Lord Leicester takes the second place with another capital specimen of the breed; and Mr. John Overman places a good third, well fed, of good form, and showing the quality of the stock of Mr. Turner and Lord Leicester, from which this animal was bred. General Hood's steer, in the class, is small-framed, though in rare meaty condition. The older Devons are in great force; Mr. Heath's ox, from the stock of Mr. Passmore, being all meat, of rare touch and quality, and with a very small proportion of bone. Some question may be raised whether Lord Leicester's third-prize should not have been a-head of General Hood's second-prize steer; the latter is not well-shaped about the loin and rump; but splendid beef has carried the day; and after all, the butcher must be thought of, as well as the breeder and grazier, in a professedly fat-stock show. Mr. Farthing's steer has great size, but fails in point of quality; and Mr. Osborne's is a compact well-fed animal, deserving of special mention. The remainder of the class is good, as is evident from the fact of Mr. Tucker's third-prize beast at Bingley Hall being here without a place among the honours. In the Devon cows, Mr. Tucker's first-prize Birmingham cow "Bonny," and a very good one too, is beaten by three clearly superior animals. General Hood's third-prize cow, "Hyacinth," bred by the late Prince Consort, is prime in every respect; Mr. Heath's old cow "Stately" is fairly in the second place, in spite of too much lumpy flesh to be a perfect model; and Mr. John Overman's "Fanny" eclipses all, for symmetry,

beauty, and good feeding combined. The heifers are of considerable merit. Mr. Smith's Birmingham first-prize heifer, all fat and flesh, is here only third to two much better animals; namely, Mr. Farthing's heifer by "Sir Peregrine," and Mr. Ford's "Almatena," which takes the first prize for splendid form, and great weight of good meat.

The HEREFORDS number four entries more than last year. In the class for young steers, Mr. Shirley's first-prize Birmingham beast is here second to General Hood's steer, which was not even commended at Birmingham. Neither is a first-class animal, but the Royal beast has certainly the fewest faults; he has a grand back and loin, and better fore-quarter than the other, and more of the true Hereford character, though a somewhat loose handler; the girth is 7 feet 8 inches, and length 4 feet 9 inches; of Mr. Shirley's—girth 8 feet, length 4 feet 10 inches. Mr. Bettridge's third-prize steer girths 8 feet 5 inches, and though three months older than Mr. Shirley's, is inferior in some of the principal points. In the class of older males, we find the crack steer of the show, Mr. Heath's silver-cup, or *quondam* gold-medal, ox, the best male animal in all the cattle classes. This is an extraordinarily great and grand specimen of the breed—very large in frame, broad, deep, wonderfully straight, level, and heavily-covered at every good point; the girth is 9 feet 4 inches. Unfortunately, this true ox is off his legs, and even on Monday was evidently doubling up; but when seen on all-fours, his appearance is very taking, his bone fine, head handsome, coat of the right character, and handling indicative of superb beef. Mr. Symonds need not grieve at coming only second after such a specimen, and does well to step in before Mr. Aldworth's very big and good third-prize ox. Mr. Phillips' Birmingham commended ox is here "nowhere." The judges have chopped the Birmingham decisions about in a strange manner; and the Fates have still further over-ruled the elements, to derange the awards of that occasion. The foot-and-mouth distemper has knocked down Mr. Groves' splendid Birmingham first-prize heifer, which we had hoped would have here won something like a position, as she was hardly well enough treated at Bingley Hall. Here, however, she could but get a second place to Mr. Bettridge's "Young Beauty," that was second at Birmingham. This heifer had firm first-class flesh, but no such perfection as that of her unlucky competitor; and we look upon the Islington ruling as altogether a mistake. Mr. Williams' "Duchess," that was third at Birmingham, takes no prize here; but Mr. Hunt's heifer steps in as third—certainly an excellent and handsome animal. Mr. Baldwin's "Empress," highly commended at Birmingham, is obliged to follow suit to Mr. Hunt's heifer, that was there unnoticed. Among the cows, Islington has not beaten Mr. Pitt's "Cherry;" and General Hood and Mr. Draper change their Birmingham places, to the advantage of the former; being, as we then said of her, both smarter and neater than the other.

Spurred up by their mediocre position of last year, the SHORTHORNS have come up in strong force—no less than 55, instead of 44 entries. Mr. Baker's Birmingham gold-medal roan is here again the conqueror among its breed; a grand beast, with a wonderfully round barrel of flesh, and only here and there a fault to be found; but good as he undoubtedly is, we cannot class this animal with some that have occasionally astonished the world in former years. Mr. Swinnerton's ox is second again, as at Birmingham; a very good beast, of great size, rare quality,

but somewhat defective both in thigh and shoulder. Mr. J. B. Thompson's white ox is also third again. Few other noticeable animals appeared in the class, beyond perhaps Mr. Aldworth's very heavy roan. There was a very large class of young steers, and as intimated in our Bingley Hall report, good judges have seen cause to prefer Mr. John Thompson's steer to that of the Duke of Beaufort; as indeed, to still better beasts than His Grace's. Mr. Thompson's roan, highly-commended at Birmingham, here takes the highest place in the class; and, after carefully examining all points, we are perfectly satisfied that the award is right, and, as we said at time, that the Birmingham decree was wrong. The Duke's steer, though given a third prize at Birmingham, is very imperfect in form, the shoulder-blades grown out like those of old-worked plough oxen, and the flesh much too patchy. Mr. Sisman's commended steer is more meritorious in regard to symmetry, though rather a loose handler; while Mr. Stainforth's steer, that was first in his class at Birmingham, went thence to Liverpool; so that Earl Radnor's thick, good roan beast, with beautiful form and rare rounds of beef, gets the second prize, after Mr. Thompson's first. Mr. Hulbert's steer is square, deep, and good, but wanting in length; Mr. Craddock's deficient in flesh, and neither level along the back nor possessing much beauty; nor is Sir Thomas Lennard's very commendable for weight or quality. General Hood is in luck in this class; but we cannot see what the judges could admire and "commend" in this white steer, with thick bone, flat side, and back out of line, unless it be the good meat, depth of carcass, general build and shaggy hair of a Highlander—hardly meritorious in a pure Shorthorn. A short show of heifers did not produce anything to equal Mr. Swaisland's Birmingham plum; and "Oak-bud" again carries off the silver cup as the best female in all the cattle classes. She is certainly very perfect in most of her points, and with nearly everything about her that a breeder may admire; saving, as we reported of her at Birmingham, a lack of feminine character, particularly about the head. The first prize roan and red cow of Mr. Matthews, "Beauty," was not at Birmingham: she is exceedingly level and handsome, with rare hind-quarters, and fine offal; but some question was raised by many critics as to the merits of the second and third prize cows. Mr. Lynn's well-known "Luck's-all, taking the second prize, has a sweet head, but is deficient before the shoulder, and with very loose blubber beef. Mr. Abbott's third-prize roan cow "Nonpareil" is exceedingly good; but while fatter, also two years older than the other. All things considered, these animals could scarcely have been placed otherwise than as they are. Among the remaining cows, Mr. Edmonds' "Beauty" is worthy of mention, as large-framed, level, and good in quality.

Last year we had but eleven **SUSSEX** cattle; this time, that useful breed numbers thirty entries. Mr. Shoosmith's first-prize steer is just the sort for the meat-market. Mr. Neale, Messrs. Heasman, Mr. Botting, and Mr. M. Montefiore also show some very well-formed, well-fed, and valuable animals. Messrs. Heasman's first prize cow, and Mr. Shoosmith's second-prize, "Lovely," are beautiful beef, with considerable merit for symmetry and fine breeding; and the Sussex evince still further advancement in that style and quality so observable on the last few occasions.

NORFOLK or **SUFFOLK POLLS** were exceedingly scarce last year, when we had but two entries; but this season we have as many as seven. Mr. Oliver, Mr. Wortley, Mr. Mulleu, and Mr. Collins exhibit some creditable specimens of breeds—more valuable than their scanty appearance at our fat stock shows might lead us to suppose; although in some instances the evidence of a cross with horned cattle was very apparent.

The **LONGHORNS** number half-a-dozen entries, instead

of only four, as last year; and their general quality is really good. Mr. Chapman, Mr. Cox, and Mr. Burberry show animals of great substance and rich flesh; Mr. Burberry's cow being the best of the breed, and one of the best seen for some seasons.

SCOTCH HORNED CATTLE numbered only four last year; but this Christmas, they have grown to eleven. Mr. Sneyd's splendid West Highlander, grand in every point, and about as good as we ever saw of this fine breed, is of course first, and really the only question is whether he should not have been the Champion Cup ox of the show? Mr. Allan Pollok's ruddy-coated ox is not half a bad second; and Mr. Eastwood's heifer is extremely handsome, very compact, with beautiful touch, and characteristic shaggy black coat.

The **SCOTCH POLLS** are eleven—an increase of four entries. Mr. M'Combie's big Birmingham first prize Aberdeen, again takes the top place; and Mr. Heath's prime Galloway is once more second here. The North British cattle are teaching some of the Southern breeders a lesson of improvement; and the black polled and rough-coated, long-horned West Highlanders are likely to continue amongst the most attractive features in the Smithfield Club Show.

There was one **IRISH COW** last year; but now there are three oxen and a cow. Mr. Sewell Read's light-roan-coloured ox has much of Shorthorn excellences about it; and the Earl of Darnley showed a nice Kerry.

Of **WELSH CATTLE** there are but four, a decrease of one since last year; although these runts are amongst the most valuable beasts that either the butcher or the grazer ever get hold of. Here Mr. Sewell Read and Mr. Bennett take first prizes with animals of considerable merit.

The **CROSS** or **MIXED-BRED CATTLE** number nineteen entries, or one in excess of last year. Mr. Wortley's Devon and Polled Norfolk is very good, and quite Devonian in character. Mr. John Overman's Devon and Shorthorn is very great and good, but more like a Shorthorn than anything else. Mr. Mitchell's cross between Longhorn and Shorthorn is conspicuous for immensity of frame rather than for weight of good flesh put upon it. Mr. Farthing's Guernsey and Devon heifer is very like a good Devon; and Mr. Allan Pollok's Shorthorn and Galloway heifer, black, and without horns, is very symmetrical, fat, and of capital quality. She was one of the plums of the pudding, and, as we wrote of her at Birmingham, "a picture to look at—round, true, and as full as an egg of good meat all over her;" while she now easily defeated the cow placed above her in Bingley Hall. But the curiosity of the "cross or mixed breed" classes was Mr. Tingey's second-prize ox, described as a cross between the Lincoln and Yorkshire breeds. The latter, we take it, implies a Shorthorn: but what is the Lincoln breed if that is not also of the Durham character? At any rate, as we are assured, at the recent meeting at Wayland in Norfolk Mr. Tingey's beast was entered as a Shorthorn, taking a second prize to Mr. Mathews' cow, which was placed first. At Islington the two are again first and second, but with the Merton cow still a Shorthorn, and the Ellingham ox a cross! We do not say that judges should be able to distinguish a cross-bred beast from his mere appearance; but surely it is their business to inquire of what the cross or mixed breed really consists? and perhaps these gentlemen in support of their award will be kind enough to define the difference between the Yorkshire and Lincolnshire breeds.

The **EXTRA STOCK CATTLE** classes have largely increased; there being here no less than 85 entries, instead of 18 as at last year's show. Mr. Birkbeck's prize Devon is a very good animal, and stands alongside a most tremendous beast—a Shorthorn, exhibited by Mr. Robt. Wortley. There are many very good specimens in this odd lot. Mr. Packe's white heifer is certainly a beauty, and several

cows and heifers in the same class would have shown well among the prize animals in the various pure-breed classes. Mr. Giblett's Alderney and Mr. Whitley's red and white Brittany diversified the character of this department, which was of more than ordinary merit.

As a whole, the cattle classes formed a good average exhibition—numbers compensating in some degree for the want of unprecedented excellency in individual animals and the presence of rather too much common market-beef.

We have only a dozen entries of LEICESTER SHEEP, while last year there were 21. A larger frame and more substance, with a greater wealth of wool, seem to characterize this breed, in comparison with the fineness and quality which once won all the prizes. Mr. Foljamb's first-prize wethers are prime in every respect, with backs extremely well covered, good legs of mutton, and excellent fleeces. They well deserve the silver cups which they have carried off as the best sheep in the Leicester and long-wool classes. Colonel Lowther's second-prize wethers are not very much inferior; and Mr. Lovell's also were well worthy of their prize. Lord Berners' shows a capital pen of "wethers not exceeding 220lbs. live weight;" and Colonel Lowther and Mr. Willmore follow suit with very commendable mutton and wool. But there is no superlative merit such as occasionally forms a feature in the sheep classes at the Club show.

Of the COTSWOLDS the less said the better. There are but two entries, against eight last year; and the specimens sent are so little characteristic of this noble breed that the prizes are justly withheld.

Of LINCOLNS we have four entries, against two last year; and these are fair specimens of a very valuable kind of sheep. Mr. Cranfield's wethers are very heavy, well-formed, with good wool, and handsome looks; and both Mr. Marshall's second prize wethers and Mr. Codling's are very good sheep.

The ROMNEY MARSH sheep have put in an appearance with three pens, though none were entered last year. Mr. Murton's are better specimens of the hardy breed than have shown themselves before, with something like symmetry, and less of the ungainly form that used to detract from their catalogue of good qualities.

The LEICESTER and LONGWOOL "Extra Stock" make a short show—only 23 entries, against 32 last year. Colonel Lowther and Mr. Lynn win among the Leicester wethers and ewes respectively. In the class now separated for Longwools not Leicesters, Mr. Porter shows a Cotswold ewe of large proportions, heavily-fleshed and handsome as the breed generally is; and Mr. Marshall and Mr. Lynn have some very good Lincoln ewes.

The SOUTHDOWNS number only 24, instead of 23 entries, as last year. Lord Walsingham's first-prize wethers got the Silver Cup for the Down classes. These are most perfectly-formed and handsome animals, true and level, fully equal to anything ever seen in quality, with very fine wool; and beyond all this, they have the merit of carrying great weight upon their delicate bone. It is alleged that these three sheep weigh, alive, 49 stones (imperial) and 12lbs., or 3½ stones more than the prize sheep of last year. The Duke of Richmond's are by no means to be despised, keeping up the olden fame of the Goodwood flock; and the Earl of Radnor falls only a little way behind, with an admirable pen of very pretty Downs. In the class of wethers under 200lbs. live weight, the Merton flock is first again, and the Duke of Richmond and the Earl of Radnor meritoriously second and third, as before. For older wethers, the Duke of Richmond fairly beats Lord Walsingham, and the Earl of Radnor gains only a "high commendation," after Mr. Jno. Overman's third prize.

The HAMPSHIRE or WILTSHIRE DOWNS number about

as last year. Mr. Canning's are superb sheep, with extraordinary backs, rare legs, great frames heavily loaded with beautiful mutton, and with a considerable weight of good wool; but while very long, not so symmetrical as a perfect model requires. Mr. Bennett's second prize and Mr. King's third prize wethers are not very specially commendable. Is it a judge's duty to give any honour whatever to sheep which, good as they may be, have a staple of wool over the loin of scarcely any length at all, while in other parts it is some inches long?

There are 10 entries of SHROPSHIRE, against 12 last year. Some of the pens are exceedingly fine. Mr. Henry Smith's, which were only commended at Birmingham, has very properly beat Lord Wenlock's, which there got a first prize. In the class of older sheep, Mr. Horley's wethers, not even commended at Bingley Hall, and Mr. Holland's, which were equally unnoticed there, are here placed first and second, beating Mr. Orme Foster's, which were not only first prize, but also the extra-prize sheep, at Birmingham. This is curious, as Mr. Foster's and Mr. Smith's sheep are bred exactly the same way, while one flock is preferred and the other discarded in Birmingham, and *vice versa* in London.

The OXFORDSHIRES number four entries, as last year, Mr. Overman, Mr. Druce, and Mr. Stilgoe being the prize winners. But really, the trimming and greasing are too bad for anything; why does not authority make itself respected in putting down (un)fair exteriors, no matter how valuable the carcass thus hidden under a deceptive contour? Mr. Charles Howard, who does not deign to fashion his sheep, is not here an exhibitor, but the first and third prizes are from his stock.

We had six entries of MOUNTAIN sheep last year; this time we find eight. The little white-faced Exmoor horns are much improved; in fact they are so good that they don't like being beaten by Mr. Downing's excellent pen of Old Herefords or Ryelands. A question was raised as to whether the large heavy sheep are *bona fide* a "Mountain" breed; and the Council decided that, though so greatly improved, they must be considered as entitled to compete in this class. Mr. Eastwood's Old Lancashire, or "Lonk" sheep, of immense length, though not so symmetrical as Downs, with black and white speckled faces and fine wool—longer than Down wool, but shorter than Leicester—gain the first prize in the "Black-faced or Speckled-faced" class; and are certainly a very valuable sort for moor and mountain.

"Extra Stock" gives us 30 entries, against 16 last year. The Duke of Richmond's first prize Southdown wether is of splendid quality, but not of great weight; and Mr. Overman's, Lord Walsingham's, and the Earl of Radnor's are very good. Lord Walsingham's Silver Medal ewe was in the Worcester first prize pen, and from this show will go home to breed from again—if so, how can she be in place at this show of butchers'-meat? There is an extremely good class of Shortwools not Southdowns, in which Mr. Henry Smith has the honour of beating Mr. Druce, Mr. Charles Howard, and so on, with a capital Shropshire ewe.

There are 14 entries of LONG and SHORT WOOL CROSS-BREDS—just the same number as last year—Mr. Jno. Overman's Leicester and Southdowns, winning the silver cup for this class of sheep, are most splendid animals, of great substance and beauty. Perhaps it is hardly fair for the Shropshires to compete against the cross-breeds for the cup, as no pure breed can be sure of a place against the "chances" which now and then come, of pairing long and short wools together. Mr. James' West-country Down and Leicester wethers are exceedingly good; and Mr. Hewer shows some great and prime West-country Downs and Cotswold sheep. At least one pen in this class is shamefully trimmed. In the class of "wethers not exceed-

ing 290 lbs. live weight," Mr. Jno. Overman is again successful with a capital pen of his Leicester and Southdown cross; and Mr. Hache comes second with some good Cotswold and Sussex Down sheep.

The EXTRA STOCK CROSS-BREDS number about as last year, and make a good show of 11 entries—Mr. Jno. Overman adding the silver medal to his other honours.

The thirty-seven entries in the pig part of the show about equal the number of last year. In the class of "pigs of any breed, not exceeding 4 months old," are many little wonders. Mr. De la Rue's black Essex beauties, very fat and well developed, at 2 months and 11 days old, won the first prize; and Messrs. Barber came second and third, with the "improved Middlesex" breed. Sir Thomas Lennard's white Essex pigs are of great merit, in the class for pigs not exceeding 8 months old; in which also the Countess of Chesterfield distinguishes herself with "Bretby whites," and Mr. Stearn gets a third prize with his "small black Suffolk breed." Mr. Morland's white "improved Chiltons" are first in the class of pigs not exceeding 12 months old; and Mr. Bigg's "Berkshires" and Mr. Slade's "small Yorkshires" are only a little inferior. The gold medal for the best pigs is won by General Hood, in the class for pigs under 18 months old. These three white "Prince Albert's Windsor" are magnificent in every respect, wonderfully developed at both ends, all pork on a minimum of bone, with fine ears and heads. Mr. Morland, Mr. Crisp, and the Countess of Chesterfield are also great in this class.

The extra stock number nineteen entries, or four over last year's show. Mr. Stearn gets the silver medal for a "small black Suffolk;" but many exceedingly good animals appear in this class. Altogether, the pigs are good, but not beyond what we have seen on former occasions.

The purchases by the butchers during the week were so few, with what they have been, that we have deferred making out any sale list. The weather has probably much to do with so bad a business.

PRIZE LIST.

CATTLE.

DEVONS.

JUDGES.—(And for Herefords, Sussex, Norfolk, Longhorn, Irish, and Crossbred Cattle.)—

John Buckley, Normanton Hill, Loughborough.
John Coleman, The Farm, Woburn Park, Beds.
Robert Smith, Emmett's Grange, South Molton.

Steers, not exceeding three years old.—First prize, 30*l.*, and Silver Medal as breeder, R. Wortley, Suffield Hall, Aylsham, Norfolk. Second of 20*l.*, the Earl of Leicester, Holkham, Wells, Norfolk. Third of 10*l.*, J. Overman, Burnham Sutton, Burnham Market, Norfolk. *Commended:* Major-General the Hon. A. N. Hood.

Steers or Oxen, above three years old.—First prize, 30*l.*, W. Heath, Ludham Hall, Norwich, and Silver Medal as breeder to J. Passmore, Twicken, South Molton. Second of 20*l.*, Major-General the Hon. A. N. Hood, Cumberland Lodge, Windsor. Third of 10*l.*, the Earl of Leicester.

Heifers, not exceeding four years old.—First prize, 25*l.*, J. Ford, Jun., Rushton, Blandford (Almatens), and Silver Medal as breeder to C. J. Louch, Westfield-place, Kingston-on-Thames. Second of 15*l.*, W. Farthing, Stovey Court, Bridgewater. Third of 10*l.*, W. Smith, Southernhay, Exeter.

Cows, above four years old.—First prize of 25*l.*, J. Overman, Burnham, and Silver Medal as breeder to Mrs. Clarke, Burnham Market, Norfolk (Fanny, had three calves). Second of 15*l.*, W. Heath, Ludham (Stately had six calves). Third of 10*l.*, Major-General the Hon. A. N. Hood (Hyacinth, had two calves).

HEREFORDS.

Steers, not exceeding three years old.—First prize, 30*l.*, Major-General the Hon. A. N. Hood, and Silver Medal as breeder to H.R.H. the late Prince Consort. Second of 20*l.*, R. Shirley, Burcott Munsalow, Church Stretton. Third of 10*l.*, H. Bettridge, East Hanney, Wantage, Berks.

Steers or Oxen, above three years old.—First prize of 30*l.*, and SILVER CUP, value 40*l.*, as "best steer or ox in any of the classes," W. Heath, Ludham; with Silver Medal as breeder, T.

Lockley Melre, Cound Arbour, Shrewsbury. Second of 20*l.*, W. Symonds, Lambourne, Romford. Third of 10*l.*, W. Aldworth, Frilford, Abingdon. *Highly commended:* J. Phillips, Ardington, Wantage.

Heifers, not exceeding four years old.—First prize, 25*l.*, H. Bettridge, East Hanney, and Silver Medal as breeder to—Tudge, Adforton, Lenkwardine (Young Beauty). Second of 15*l.*, W. Groves, Walk Mills, Shrewsbury. Third of 10*l.*, C. Hunt, Widemarsh, Hereford.

Hereford Cows, above four years old.—First prize, 25*l.*, and Silver Medal as breeder, G. Pitt, Chadron Court, Dilwyn, Loominster (Cherry, had three calves). Second of 15*l.*, Major-General the Hon. A. N. Hood (Superb, had five calves). Third of 10*l.*, J. S. Draper, Thinghill Grange, Hereford (Cowlip, had three calves).

SHORTHORNS.

JUDGES.—(And for Scotch, Welsh, and Cattle in Extra Stock.)—
John Brown, Coldham Hall, Yorkshire.

Thomas Parkinson, Hengrave-place, Southwell, Notts.
William Sanday, Holme Pierrepont, Notts.

Steers, not exceeding three years old.—First prize, 30*l.*, and Silver Medal as breeder, J. Thompson, Badminton, Chippenham. Second of 20*l.*, the Earl Radnor, Coleshill, Highworth. Third of 10*l.*, Sir A. de Rothschild, Bart., Aston Clinton, Tring. *Commended:* Major-General the Hon. A. N. Hood; W. Sloman, Buckworth, Kimbolton; and E. L. Betts, Preston Hall, Aylesford.

Steers or Oxen, above three years old.—First prize, 30*l.*, William H. Baker, Cottesmore, Oakham, Rutland, and Silver Medal as breeder to the late R. W. Baker, Cottesmore. Second of 20*l.*, R. Swinnerton, Weddington Grove, Nuneaton. Third of 10*l.*, J. B. Thompson, Anlaby, Hull. *Highly commended:* The Earl of Spencer, Althorp; and W. Aldworth, Frilford. *Commended:* J. Codling, Whaplode, Spalding; Sir W. de Capell Brooke, Bart., Geddington, Kettering; and R. Wortley, Suffield Hall.

Heifers, not exceeding four years old.—First prize, 25*l.*, and SILVER CUP, value 40*l.*, as "best heifer or cow in any of the classes," C. Swaisland, Crayford, Kent (Oakbud), with Silver Medal as breeder to Lady Lubbock, High Elms, Farnborough, Kent. Second of 15*l.*, R. Stratton, Faulk's Court, Stapleton, Bristol (Luna). Third of 10*l.*, J. Faulkner, Bretby Farm, Burton-on-Trent (Miss Prime).

Cows, above four years old.—First prize, 25*l.*, and Silver Medal as breeder, T. Mathews, Merton, Thetford, Norfolk (Beauty). Second of 15*l.*, J. Lynn, Church Farm, Stroton, Grantham (Luck's-all). Third of 10*l.*, C. H. Abbott, Long Ashton, Bristol (Nonpareil).

SUSSEX.

Steers or Oxen, not exceeding three years old.—First prize, 20*l.*, and Silver Medal as breeder, J. Shoosmith, Berwick, Lewes. Second of 10*l.*, W. Wood, Ifield Court, Crawley.

Steers or Oxen, above three years old.—First prize, 25*l.*, and Silver Medal as breeder, M. Montefiore, Worth Park, Crawley. Second of 15*l.*, Wm. Botting, Westmeston-place, Hurstpierpoint. Third of 10*l.*, E. Cane, Berwick Court, Lewes. *Commended:* J. Neale, Coldwaltham, Petworth.

Heifers or Cows, of any age.—First prize, 20*l.*, and Silver Medal as breeders, J. and A. Heasman, Angmering, Arundel. Second of 15*l.*, J. Shoosmith, Berwick. Third of 10*l.*, Pennington Gorringe, Pebsham, Sidley, Battle.

NORFOLK OR SUFFOLK POLLED.

Steers or Oxen, of any age.—First prize, 15*l.*, and Silver Medal as breeder, R. J. Oliver, Docking, Norfolk. Second of 10*l.*, R. Wortley, Suffield.

Heifers or Cows, of any age.—First prize, 15*l.*, and Silver Medal as breeder, W. T. Mullen, Knaxton, North Walsham (Beauty). Second of 10*l.*, Barnabas Collins, Hunston, Ixworth.

LONG-HORNS.

Steers or Oxen, of any age.—First prize, 10*l.*, and Silver Medal as breeder, R. H. Chapman, Upton, Nuneaton. Second of 5*l.*, W. T. Cox, The Hall, Spondon, Derby.

Heifers or Cows, of any age.—First prize, 10*l.*, and Silver Medal as breeder, J. H. Burbery, The Chase, Kenilworth. Second of 5*l.*, W. T. Cox Spondon. *Commended:* H. E. Chapman.

SCOTCH HORNED.

Steers or Oxen, of any age.—First prize, 20*l.*, R. Sneyd, Keele Hall, Staffs; the breeder unknown. Second of 15*l.*, Allan Pollok, Lismany, Ballinacree, Galway. *Highly commended:* B. E. Bennett, Marston Trussell Hall, Rugby. *Commended:* The Duke of Beaufort, Badminton, and H. Frampton, Blandford.

Heifers or Cows, of any age.—First prize, 15*l.*, R. Eastwood, Thorney Holme, Clitheroe, Lancashire; the breeder unknown.

SCOTCH POLLED.

Steers or Oxen, of any age.—First prize, 20*l.*, W. M'Combie, Tillyfour, Aberdeen; and Silver Medal as breeder, J. Stephen, Conglass, Keith Hall, Aberdeen. Second of 15*l.*, W. Heath, Ludham. *Highly commended:* J. and W. Martin, Aberdeen. *The class generally commended.*

Heifers or Cows, of any age.—First prize, 15*l.*, and Silver Medal as breeder, the Earl of Southesk, Kinnaird Castle, Brechin, Forfarshire. Second of 10*l.*, J. Stewart, New Market, Aberdeen.

IRISH.

Steers or Oxen, of any age.—First prize, 10*l.*, Clare Sewell Read, Plumstead House, Norwich; the breeder unknown.

Heifers or Cows, of any age.—First prize, 10*l.*, the Earl of Darnley, Cobham Hall, Gravesend, Kent; the breeder unknown.

WELSH.

Steers or Oxen (Runts), of any age.—First prize, 20*l.*, B. E. Bennett, Marston Trussell; the breeder unknown. Second of 10*l.*, H. Platt, Bryn-y-newadd, Bangor, Carnarvon.

Heifers or Cows, of any age.—First prize, 10*l.*, Clare Sewell Read, Plumstead House; and Silver Medal as breeder, W. B. Roberts, Loveston, Pembroke.

CROSS OR MIXED-BRED.

Steers, not exceeding three years old.—First prize, 20*l.*, and Silver Medal as breeder, J. Wortley, Felmingham, North Walsham (Devon and Polled). Second of 15*l.*, J. Stewart, Aberdeen (Shorthorn and Aberdeen).

Steers or Oxen, above three years old.—First prize, 20*l.*, and Silver Medal as breeder, J. Overman, Burnham Sutton (Devon and Shorthorn). Second of 15*l.*, J. Tingey, Little Ellingham, Aulseborough, Norfolk (Lincoln and Yorkshire). Third of 10*l.*, J. and W. Martin (Shorthorn and Aberdeen). *Highly commended:* F. Neale, Poyham, Chichester (Devon, Sussex, and Shorthorn). *Commended:* G. Maxwell, Kidbrook Manor, Blackheath (Devon and Shorthorn).

Heifers, not exceeding four years old.—First prize, 15*l.*, and Silver Medal as breeder, Allan Pollok, Lismany (Shorthorn and Galloway). Second of 10*l.*, E. Farthing, Farrington Farm, North Petherton, Bridgewater (Guernsey and Devon). *Highly commended:* J. and W. Martin (Aberdeen and Shorthorn).

EXTRA STOCK.—CATTLE.

Silver Medal and 5*l.* prize, as the best Steer or Ox in Extra Stock.—R. Birkebeck, Gatton, Reigate (Devon). *Highly commended:* Major-General the Hon. A. N. Hood (Hereford); and Allan Pollok (Shorthorn and West Highland Cross).

Silver Medal and 5*l.* prize, as best Heifer or Cow in Extra Stock.—C. W. Packe, M.P., Prestwood Hall Farm, Loughborough (Shorthorn). *Highly commended:* Lord Feversham, Duncombe Park (Shorthorn), and C. Duffield, Marcham Park (Shorthorn). *Commended:* E. Eastwood, Thorney Holme, Clitheroe (Scotch heifer); J. Clayton, Littlebury, Saffron Walden (Shorthorn); Major-General Hon. A. N. Hood (Devon); W. Smith, Southernhay (Devon).

SHEEP.

LEICESTERS.

JUDGES (and for Cotswold, Lincoln, Romney Marsh, Crossbred, Oxford, and Mountain Sheep)—

Marshall Hesley, Croft, Boston.
John H. Phillips, Beadlam Grange, Newton, Yorkshire.
Francis Spencer, Alma House, Claybrook, Lutterworth.

Wethers, one year old (under twenty-three months).—First prize, 20*l.*, with Silver Medal as breeder, and SILVER CUP, value 20*l.*, as "best pen of Longwools in any of the classes," G. S. Poljame, Osberton Hall, Worksop. Second of 15*l.*, Hon. Colonel Lowther, Barleythorpe Hall, Oakham. Third of 5*l.*, E. Lovell, Knapton, Malton.

Pat Wethers, one year old (under twenty-three months), each sheep not to exceed 220*lbs.* live weight.—First prize, 20*l.*, and Silver Medal as breeder, Lord Berners, Keythorpe Hall, Leicester. Second of 15*l.*, the Hon. Colonel Lowther. Third of 5*l.*, Lawrence Willmore, The Newark, Leicester.

COTSWOLDS.

Wethers, one year old (under twenty-three months).—No prizes awarded — not sufficient merit.

LINCOLNS.

Wethers, one year old (under twenty-three months).—First prize, 20*l.*, and Silver Medal as breeder, W. Cranfield, Buckden, Huntingdon. Second of 15*l.*, T. B. Marshall, Brantam, Lincoln. Third of 5*l.*, J. Wyles, Welby Warren, Grantham.

OTHER LONG-WOOLS.

Wethers, one year old (under twenty-three months).—First prize, 15*l.*, and Silver Medal as breeder, F. Murton, Smeath, Ashford (Kentish). Second of 10*l.*, J. Newport, Elmsted Court, Ashford (Kentish).

EXTRA STOCK.—LONG-WOOL.

Silver Medal, as the best Leicester Wether in extra stock.—The Hon. Colonel Lowther. Silver Medal, as the best Leicester Ewe in extra stock.—John Lynn, Church Farm, Stroxtun. Silver Medal, as best Long-wooled Sheep (not Leicester) in extra stock.—T. Porter, Beaumont, Cirencester (Cotswold).

SOUTHADOWNS.

JUDGES (and for Hampshire and Shropshire Sheep)—
C. Randall, Chadbury, Evesham.
J. S. Turner, Chyngton Farm, Seaford, Lewes.
Henry Webb, Streety Hall, West Wickham, Linton.
Wethers, one year old (under twenty-three months).—First

prize, 20*l.*, with Silver as breeder, and SILVER CUP, value 20*l.*, as "best pen of one year old Southdowns, Hampshires, or Wiltshire Downs," Lord Walsingham, Merton Hall, Thetford, Norfolk. Second of 10*l.*, Duke of Richmond. Third of 5*l.*, the Earl of Radnor, Colehill, Highworth. *Highly commended:* J. J. Farquharson, Langton House, Blandford.

Wethers, one year old (under twenty-three months), each sheep not to exceed 200*lbs.* live weight.—First prize, 15*l.*, and Silver Medal as breeder, Lord Walsingham. Second of 10*l.*, the Duke of Richmond, Goodwood, Chichester. Third of 5*l.*, the Earl of Radnor. *Commended:* Sir T. B. Lennard, Bart., Belhus, Aveley.

Wethers, two years old (above twenty-three and under thirty-five months).—First prize, 20*l.*, and Silver Medal as breeder, the Duke of Richmond. Second of 10*l.*, Lord Walsingham. Third of 5*l.*, J. Overman, Burnham Sutton. *Highly commended:* The Earl of Radnor.

HAMPSHIRE OR WILTSHIRE DOWNS.

Wethers, one year old (under twenty-three months).—First prize, 20*l.*, and Silver Medal as breeder, W. B. Canning, Elston Hill, Devisea. Second of 15*l.*, W. F. Bennett, Chilmark, Salisbury. Third of 5*l.*, W. King, New Hayward, Hungerford. *Highly commended:* E. Russell, Horton Kirby, Dartford.

SHROPSHIRE.

Wethers, one year old (under twenty-three months).—First prize, 15*l.*, and Silver Medal as breeder, H. Smith, Sutton Maddock, Shifnal. Second of 5*l.*, the Lord Wenlock, Bourton Cottage, Much Wenlock. *Commended:* The Earl of Aylesford, Packington Hall, Coventry.

Wethers, two years old (above twenty-three and under thirty-five months).—First prize, 15*l.*, and Silver Medal as breeder, Thomas Horley, Jun., The Fosse, Leamington. Second of 5*l.*, the Earl of Aylesford, Packington. *Highly commended:* E. Holland, Dumbleton Hall, Evesham.

OXFORDSHIRE.

Wethers one year old (under twenty-three months).—First prize, 15*l.*, A. Overman, Egmere, Brandon, Norfolk; and Silver Medal as breeder, H. W. Keary, Bridgenorth. Second of 10*l.*, Z. W. Stilgoe, Aderbury Grounds, Banbury. Third of 5*l.*, S. Druce, Eynsham, Oxford.

WHITE-FACED MOUNTAIN.

Wethers of any age.—First prize, 15*l.*, and Silver Medal as breeder, J. B. Downing, Holme Lacey, Hereford (Eyeland). Second of 10*l.*, W. Smith, Southernhay, Exeter (Exmoor).

BLACK-FACED OR SPECKLED-FACED MOUNTAIN.

Wethers of any age.—First prize, 15*l.*, and Silver Medal as breeder, B. Eastwood, Thorney Holme, Whitewell, Clitheroe. Second of 10*l.*, Jonathan Peel, Knowlmers Manor, Clitheroe (Lank).

EXTRA STOCK.—SHORT WOOL.

Silver Medal as the best Southdown wether sheep in extra stock, The Duke of Richmond. *Highly commended:* J. Overman, and the Earl of Radnor.

Silver Medal as best Southdown ewe in extra stock, Lord Walsingham.

Silver Medal as best short-wooled sheep (not Southdown) in extra stock, H. Smith, Sutton Maddock (Shropshire). *Highly commended:* W. King (Wiltshire Down), Maddock (Shropshire). *Commended:* W. B. Canning (Hampshire Down).

LONG AND SHORT-WOOLED CROSS-BRED.

Wethers one year old (under twenty-three months).—First prize 20*l.*, with Silver Medal as breeder, and SILVER CUP, value 20*l.*, as "best pen of Shropshire, Oxfordshire, or cross-breeds, in any of the classes," J. Overman, Burnham Sutton (Leicester and Southdown). Second of 10*l.*, T. James, Octagon House, Cople, Bedford (West Country Down and Leicester). Third of 5*l.*, Sir T. Barrett Lennard, Bart., Belhus Aveley, Romford (Southdown and Cotswold).

Wethers one year old (under twenty-three months)—each sheep not to exceed 220*lbs.* live weight.—First prize, 10*l.*, and Silver Medal as breeder, J. Overman, Burnham Sutton (Leicester and Southdown). Second of 5*l.*, J. Hatcher, Marlwood Grange, Bristol (Cotswold and Sussex Down).

EXTRA STOCK.—CROSS-BRED SHEEP.

Silver Medal as the best cross-bred sheep in extra stock, J. Overman (Leicester and Southdown).

PIGS.

JUDGES.—George Mann, Soawaby, Doncaster.
John Moon, Maristow, Plymouth.
John Waters, Motcomb, Eastbourne, Sussex.

OF ANY BREED.

Pigs not exceeding four months old.—First prize, 15*l.*, and Silver Medal as breeder, T. De La Rue, Hazle, Sandy, Beds (pure Essex). Second of 10*l.*, W. A. Barber, Sunning Hill. Third of 5*l.*, W. M. Barber, Sunning Hill (Improved Middlesex). *Commended:* T. Crisp, Butley Abbey, Wickham Market (Improved black Suffolk).

Pigs above four and not exceeding eight months old.—First prize, 15*l.*, and Silver Medal as breeder, Sir T. Barrett Lennard, Bart. (small white). Second of 10*l.*, the Countess of

Chesterfield, Brothy Hall, Burton-on-Trent (Brethy white). Third of N. B. G. Stearn, Brandeston, Wickham Market (small black Suffolk). *Highly commended*: E. L. Betts, Preston Hall (small white). *Commended*: J. Lynn (Stroxton white).

Pigs above eight and not exceeding twelve months old.—First prize, 15l., with Silver Medal as breeder, G. B. Morland, Abingdon, Berks (Chilton Improved). Second of 10l., J. Biggs, Cublington, Leighton Buzzard (Berkshire). Third of 5l., A. F. Slade, Kemnal House, Chislehurst (small Yorkshire). *Highly commended*: C. Cattle, Inkerson, Thornsey (Improved Lincoln).

Pigs above twelve and under eighteen months old.—First prize, 15l., with Silver Medal as breeder, and GOLD MEDAL as "best pen of pigs in any of the classes," Major-General the Hon. A. N. Hood (Windsor). Second of 10l., T. Crisp, Butley Abbey (Suffolk). Third of 5l., G. B. Morland (Chilton). *Highly commended*: The Countess of Chesterfield (Brethy white). *Commended*: W. Baker, Purewell House, Christchurch (Improved Hampshire).

Silver Medal as the best pig in extra stock, S. G. Stearn (small black Suffolk). *Highly commended*: Sir T. B. Lennard (small white). *Commended*: Major-General the Hon. A. N. Hood (Windsor); W. M. Barber (Middlesex).

THE SMITHFIELD CLUB SHOW.

PROFESSOR SIMONDS ON THE DENTITION OF PIGS.
TO THE COUNCIL OF THE SMITHFIELD CLUB.

I have to report that, in accordance with the rules of the Club, an examination has been made of the state of the dentition of each of the pigs in the several classes, for comparison with the certificates of age, and I find that the pigs shown in pens 416, 427, 427, 445, and 452 exceed the age stated by their respective owners. I also find that the dentition of the pigs in pen 436 indicates that the animals are not of the same litter. With reference to the pig No. 445, it should be observed that the animal so much exceeds the certified age as to make it manifest that a clerical error was committed by his owner in filling up the certificate, he being described as a three months and twenty-six days old pig, whereas it was at once apparent that he could not be less than four times that age. Besides the pigs named in this report as disqualified, the dentition of others, especially in the class under four months of age, showed a greater development than is consistent with absolute correctness, and as this is a circumstance of almost constant occurrence at the shows, I would suggest that for the future the class be altered from animals not exceeding 4 months to animals not exceeding 6 months; and further, that the class not exceeding 8 months be altered to 9 months, allowing the other classes to remain as now arranged.

I may add, that in pigs under four months it is difficult to decide so accurately upon the dentition as in older animals, and hence the Club is always liable to attempts being made to exhibit animals in this class which are in truth nearly five months old.

(Signed) JAS. B. SIMONDS,
Veterinary Inspector.

Agricultural Hall, Dec. 7th, 1863.

GENERAL MEETING OF THE SMITHFIELD CLUB.

The half-yearly general meeting of the members was held on the Tuesday, at one o'clock, at the Offices of the Club in the Agricultural Hall, and was well attended. The chair was taken by the President, Lord Walsingham.

The minutes of the last meeting having been read by the Secretary, Mr. B. T. Brandreth Gibbs, and confirmed, the following report of the Council was submitted to the meeting:

REPORT.

The Council have much pleasure in laying before the general meeting of the Smithfield Club their first annual report under the new constitution of the Club.

During the past year the Council have held six meetings, which have been well attended.

The following is a summary of the chief points on which they have been occupied:—

Their first act, in accordance with the resolution of the general meeting, was to prepare the new code, defining the constitution of the Club and bye-laws, by which its proceedings will in future be regulated. These were laid before the special general meeting, convened for the purpose on the 22nd May last, and, with the addition of one amendment, were duly ratified, and have thus become the fundamental rules of the Club, and unalterable, except at a general or special general meeting, on due notice being given.

The prize sheet for the present show was revised; but it had during former years been carefully considered by different Prize Sheet Committees by which it has been prepared, that it was not found to require any great alterations. The Council, however, have had the satisfaction of increasing some of the prizes, especially those for Sussex cattle, Scotch polled, and Scotch horned cattle.

They have also deemed it advisable to add one month to the ages to which sheep were restricted, thus now making the class under 23 months instead of 22 months, and 25 months instead of 24 months as formerly.

They also have introduced more stringent rules respecting Cross-bred sheep, by which no animals qualified to compete in any other classes are allowed to compete in the Cross-bred classes.

The division competing for the silver cups have been rearranged as follows:—

A silver cup, value £20, for the best pen of Leicesters, Cotswolds, Lincolns, Kentish or other Long-woolled breed, in any of the classes.

A silver cup, value £20, for the best pen of one-year-old Southdowns, Hampshire or Wiltshire Downs.

A silver cup, value £20, for the best pen of Shropshire, Oxfordshire, Cross-bred, or any other breed of sheep (not specified above) in any of the classes.

In order to induce greater competition among the butchers to become purchasers at the show, the Council have decided to offer a silver cup of the value of £10, in place of a silver medal as formerly; to the butcher who shall purchase stock to the greatest amount; and they trust that this will be generally acceptable to those for whom this compliment is intended.

The alteration of the day for the private view has also occupied the attention of the Council, and, with the concurrence of the Agricultural Hall Company, it has been decided to revert to the Monday of the show week for the judges to make their award, and to open the yard for the private view, and the public on the payment of five shillings, as soon after 2 o'clock in the afternoon as possible.

In consequence of the above arrangement, and also the continued annual increase in the shows, it has been deemed necessary to increase the number of judges to five instead of three sets, making a total of fifteen judges.

The method of appointing the judges has also been altered, viz., instead of as formerly each steward nominating a judge, each member of Council was invited to send to the Honorary Secretary a list of gentlemen whom he might wish to recommend as judges, and from this list the Council have selected those who have adjudicated at the present show.

The appointment of stewards having been vested in the Council, they have deemed it advisable to elect the two new stewards of live stock without defining any particular department, so as to render their assistance available as occasion may require.

In addition to the usual number of stewards of live stock, two stewards of the implement department have been added.

In consequence of the continued increase in the Secretarial duties, and in order in some measure to relieve the Honorary Secretary from the clerical work of receiving the entries for stock and implements, which rendered his attendance necessary during the whole of that portion of the autumn immediately preceding the last day of entry, in order to open letters, &c., the Council have placed a sum of 50 guineas at the disposal of the Honorary Secretary, with power to appoint an Assistant Secretary, subject to his directions and supervision.

The Council have much pleasure in laying before the members the balance-sheet for the year, duly audited by the stewards up to December 1st, which shows balances in hand amounting to £4,331 14s. 8d. To this has to be added the sum of £1,000, which the Agricultural Hall Company has to pay for the present show; so that they confidently anticipate

that after having paid the prizes now awarded and current expenses, there will be so ample a balance as to admit of a still further increase in the amount to be offered in prizes next year.

The invested capital of the Club amounts to £2,691 4s. 3d. stock standing in the names of the Trustees in the Three per Cent. Consols. This includes £1,500 surplus of annual income invested till wanted for current expenses.

The Agricultural Hall Company have liberally constructed additional rooms for the use of the members and the officers of the Club, with direct access from the main building. These additions and improvements no doubt will prove a great convenience.

The Vicar of Ialington, the Rev. Daniel Wilson, M.A. having kindly volunteered to give a special service in the Hall for the herdsmen and shepherds in charge of the live stock, on the Sunday during which the animals are in the yard, the Council cordially accepted this offer, and have pleasure in stating that a considerable number attended, and are reported to have paid marked attention during the service, and the Council have voted their best thanks to the Vicar for his kindness.

The entries for the present Show have been in excess of any former occasion—no doubt caused by the increased prizes that have been offered during the last few years having now had time to take effect.

The Council regret to find that for the last few years several exhibitors have failed to send animals they had entered, and also have neglected to give notice of their intention to withdraw them; the consequence is that stalls and pens have to be prepared, thus occupying space that might advantageously be divided among other animals; and in addition to this, the uniformity in arrangement of the Show is naturally injured. The Council will take the subject into consideration, and endeavour to frame some rule to meet the circumstances of the case.

In conclusion, the Council have to congratulate the members on the general prosperity of the Club. It will be their endeavours to introduce such improvements as may from time to time appear to be advisable; and they will always be happy to receive any suggestion from any members who may do them the favour to address the same to the honorary secretary, who will bring such communications before the next Council meeting after they are received.

By order of the Council,

(Signed) B. T. BRANDRETH GIBBS,
Honorary Secretary.

Lord BERNERS said: Before proceeding to propose, in accordance with the constitution of the Club, a President for the year 1865, he wished to congratulate the meeting upon the increased accommodation which they enjoyed on that occasion, and he might add upon the admirable arrangements made for the Show, and the increasing prosperity of the Club. He had now great pleasure in proposing a name which he thought would be acceptable to every member of the Society. They all remembered how many years the late Lord Spencer presided over that Club, and he had now the honour and pleasure of proposing the present Lord Spencer as one of his successors. He knew no landowner who was more amiable, or who had more endeared himself to the farmers of the neighbourhood in which he resided; added to which, his lordship was a successful exhibitor of cattle. He regretted that the state of his lordship's health had prevented him from remaining in the country during this winter season; but trusted that his health would soon be restored, and that they would have the pleasure of seeing him presiding over the Club. He begged now to propose that Earl Spencer should be elected President for the year 1865.

Lord TREDEGAR said: After what had fallen from Lord Berners, he would content himself with merely seconding the proposition.

The CHAIRMAN, after observing that he was sure the name was one which they would all hail with acclamation, put the motion, which was carried unanimously.

Before the election of Vice-Presidents, the SECRETARY remarked that, since the last annual meeting, one Vice-President, the Marquis of Huntley, had died.

Mr. TOMES said he had great pleasure in proposing the re-election of the Vice-Presidents. He deeply lamented the death of the Marquis of Huntley; and he begged to propose

that Mr. Brandreth should fill the vacancy which had thus arisen. Mr. Brandreth had been a member of the Club for thirty-seven years; he was formerly an efficient Secretary; and he was now, by his status in society as a landed proprietor, fully eligible for the office of Vice-President. He had been a zealous and steady friend of the Club, always ready to give good advice, and manifesting a deep interest in all its affairs. Mr. Brandreth being one of the oldest members of the Club, and his son one of the youngest, he had very great pleasure in proposing that he should fill the vacancy in the list of Vice-Presidents.

Mr. RIDGEN seconded the motion; and it was carried unanimously.

Mr. BRANDRETH said: When he had entered that room, he was surprised to find that his name was to be included in the list of Vice-Presidents to be submitted to the meeting. He hoped the distinction which had just been conferred upon him would, at all events, not diminish the zeal and interest which he had shown for so many years in the cause of that Club (cheers).

On the motion of Lord TREDEGAR, seconded by Mr. T. PAYNE, the Trustees were re-elected.

Mr. C. BARNETT said: As one of the trustees, he felt some gratification at being re-elected at a time when the funds of the society were in so flourishing a state, that it was not necessary for him as a trustee to place any severe restriction on the expenditure. It was also gratifying to have to hear that there would probably be an increase in the amount of the prizes next year.

Mr. GREETHAM, after acknowledging the honour of his re-election as a trustee, said he could not help expressing his regret at finding that they were on that occasion going to lose some of the best members of the Council (Hear, hear.) He hoped that before next year there would be an alteration made in the constitution, which would prevent such an evil in future.

The CHAIRMAN said the next item on the agenda paper related to the Honorary Secretary. He was sure that was a matter on which there would be no difference of opinion (Hear, hear).

Mr. MARTIN SUTTON felt great pleasure in proposing the re-election of the excellent and invaluable Honorary Secretary of the Club (cheers). The Club had long been fortunate in having that gentleman's services, and he trusted that it would be fortunate enough long to retain them (cheers).

The CHAIRMAN, in putting the question, said he had no doubt it would be seconded by all present and carried by acclamation (cheers).

The motion was then adopted.

The CHAIRMAN said the Council had prepared a list of eight gentlemen whose names were to be submitted to the meeting in lieu of the seven gentlemen who retired, by ballot, and of Mr. Bennett, who had sent in his resignation. Thus, while seven names only were balloted out, eight members virtually would have to be elected. Any member of the Club who did not approve of the list he would read to them could, of course, propose any other name.

The list referred to by the noble lord was as follows: Mr. Charles Howard, Mr. Joseph Stratton, Mr. John Overman, Mr. Henry Smith, Mr. Robert Overman, Mr. H. W. Kenney, Mr. John Thompson, and Mr. Joseph Robinson.

Mr. BEASLEY begged to mention that Mr. John Overman, having been a frequent exhibitor at the Society's shows, and intending to continue so, declined to act, and requested that his name should be omitted from the house-list now proposed. He (Mr. Beasley) would take the liberty, therefore, of suggesting that the name of Mr. John Buckley, of Normanton, Leicestershire, should be substituted for that of Mr. John Overman.

Mr. WOODS considered that the county of Norfolk was very badly represented upon the Council; in fact, with the exception of the President, it was not represented at all ("Oh, oh," and laughter). Justice required that the agriculturists and breeders of Norfolk should have at least two members on the Board. He begged to propose, therefore, the name of Mr. Robert Leeds, of Lexham.

Mr. SHWELL READ had great pleasure in seconding the motion.

The following names were then balloted out as those of the retiring members of the Council: Mr. Beasley, Mr. B. E.

Bennett, Mr. John Clayden (Chairman of the Agricultural Hall Company), Mr. J. Giblett (a Director of that Company), Mr. W. Ladde, Mr. Robert Smith, and Mr. Shuttleworth, the representative of the implement makers.

A MEMBER enquired whether the retiring members of Council were eligible for re-election on that occasion, adding that if they were not, all he could say was that it was a matter very much to be regretted, and that the rule ought to be at once altered.

The CHAIRMAN said the thing could not be helped. What was now done was in accordance with the present constitution, and if it turned out that it was not satisfactory there must be a change.

Mr. MOORE said he should have liked to see the name of Mr. Joseph Stratton on the list, and it was he who mentioned him, thinking that the name of Mr. Richard Stratton might possibly be withdrawn on the ballot; but as Mr. Richard Stratton remained, he should like to see the name of Mr. Buckley substituted.

Mr. COLBMAN said if Norfolk had reason to complain because it had not two breeders on the Council, the Hereford breeders had much greater reason, for they had not one. He would propose Mr. Duckham, the editor of the "Hereford Herd-book."

Mr. Clare Sewell Read, Mr. Woods, and Captain Tanner Davey were then appointed scrutineers, and retired for the purpose of examining the ballot-papers.

The CHAIRMAN then inquired whether any member present wished to bring anything under the notice of the Council.

Mr. W. SMITH, of Exeter, said he had entered a protest against the sheep which had gained the first prize in the Ex-moor class, numbered 339. They were said to be mountain sheep, but he would leave it to the Stewards to decide whether they were so or not.

Mr. DUCKHAM said there was one subject which he wished to mention, namely, the breeding year for cattle. All the national agricultural societies had different dates for commencing the breeding year. The Bath and West of England Society had the 1st of June, the Royal Agricultural Society the 1st of July, the Birmingham and Midland Counties Show the 1st of September, and the Smithfield Club the 1st of December. He thought it highly desirable that the Councils of those societies should in some way arrange that the breeding year should commence in all of them from the same date (cheers). He could not help thinking that the 1st of January was the proper date; but that was a matter for the consideration of the Council. The present arrangement was, he considered, very detrimental to the different shows; it limited the competition by limiting the number of animals, and therefore it detracted from the interest of the show. He threw out this suggestion in the hope that it would receive the attention of the Council.

The CHAIRMAN said he was quite sure that the question which had just been raised would receive the careful attention of the Council. No doubt what had been mentioned was an inconvenience. The only question was whether they should alter their rule for the sake of societies which had sprung up since that Club was established; but he was certain that if the Council could effect any improvement they would be happy to do so.

Mr. DUCKHAM observed that the arrangement which he suggested would only alter the date of the Club by one month. The date was now the 1st of December; and if his suggestion were adopted, it would be the 1st of January. If they all felt the inconvenience of there being different weights and measures for different parts of the kingdom, they must equally feel that of not having a uniform year for the breeding of animals.

Mr. H. CORBER begged to suggest for the consideration of the Council that the members of the Club should be permitted to be present in the Hall during the time when the judges were making their awards (Hear, hear). That might be looked upon now as almost a principle. They found it in the Royal Agricultural Society, at Birmingham, and almost everywhere except at the Smithfield Club. He thought there was nothing unreasonable in such a demand, particularly when it was considered how very few privileges the members enjoyed for their guinea a year (Hear, hear). He would suggest that the Council should take into consideration whether any harm or inconvenience was likely

to arise from allowing the members of the Club to be present while the judges were making their awards (cheers).

The CHAIRMAN observed that he could only say that on that, as on every other subject, any suggestion which was made to the Council would receive due consideration (Hear, hear). The matter had been already talked about, but no decision had been come to upon it; and he knew that a great many members were desirous that the question should be discussed, and decided by the Council.

Mr. MOORE suggested that the servants in attendance on the principal prize animals should receive some gratuity or reward, either in the form of money—say a sovereign—or of a medal.

The CHAIRMAN thought that was a matter which could not be in better hands than those of Mr. Moore, who was himself a member of the Council.

The scrutineers having returned, reported the election of the following eight gentlemen to fill the vacancies in the Council: Mr. Charles Howard, Mr. Henry Smith, Mr. Robert Overman, Mr. H. W. Keary, Mr. John Thompson, Mr. Joseph Robinson, Mr. John Buckley, and Mr. Robert Leeds.

On the motion of Lord Berners, seconded by Lord Tredgar, a vote of thanks was given to the Chairman for presiding; and, after a brief acknowledgment from the noble lord, the meeting separated.

SMITHFIELD CLUB DINNER.

The annual dinner of the Smithfield Club took place, as usual, on the Wednesday evening, at the Freemason's Hall, Lord Walsingham, the President, took the chair, being supported by Lord Berners, Lord Fereham, Lord Tredgar, and others. The attendance was wretchedly small, numbering in all a company but little over fifty, and the room presenting a melancholy spectacle of half-filled tables.

After the health of Her Majesty the Queen had been drunk with loyal enthusiasm,

The CHAIRMAN, in proposing "The Health of the Prince of Wales," said that his Royal Highness was a member of the club, and had visited the show at Islington, in which he appeared to take very great interest. The Prince was very much struck by the beauty of the animals, and the grandeur of the hall, as well as by the admirable arrangements which had been made for the show; and they might venture to hope that his Royal Highness would some day become an exhibitor (cheers). All departments of the show the Prince carefully examined, particularly the pen of pigs which came from Windsor, and he had not much doubt that his Royal Highness would, now that he had got an estate of his own, take a very lively interest in all agricultural matters (Hear, hear). In proposing "The Health of the Prince of Wales" he also asked the company to drink that of his illustrious consort the Princess of Wales, and the rest of the royal family (cheers).

The next toast was "The Army, the Navy, and the Volunteers;" Colonel Fane returning thanks for the Army, and Sir J. H. Maxwell for the Navy.

The CHAIRMAN then said: The toast I have now to propose to you is "Success to the Smithfield Club;" and interested as I have always been in agriculture, and having been for many years a member of that club and an exhibitor at its shows, I feel no difficulty in recommending it to your notice. Allow me then to congratulate you upon the great and complete success of your show this year. I understand that the entries have been more numerous than usual, and that the beauty and quality of the animals are considered to be, upon the whole, fully up to an average. The increased interest which continues to be taken by the public in the proceedings of societies like this is also a subject of congratulation (Hear, hear). We have had the honour of receiving many royal and noble visitors, but what has most struck me is the great influx of people of all classes who are rushing to behold and admire our exhibitions (cheers). Surely this is a sign that we are making progress in the right direction, and that the Smithfield Club has not retrograded (Hear, hear). We are now acting under a new constitution, and the club is governed by a council nominated by the general body of members. I

trust that in all respects this may be found to work satisfactorily, and as to a great part of it I believe that it does so. But there is another part of it to which I would desire to ask your attention. It was determined on the remodelling of our laws, and that by a considerable majority, that one-third of the members of council should retire by rotation, and should not be eligible for re-election for the next two years. Of course, the first year it is necessary that the retiring members should be drawn by ballot; but when we did come to the ballot it struck me as unfortunate, as I am sure it must have done everyone present, that the seven balloted out should be some of the very best and most useful members of the council (Hear, hear). Now, without expressing any particular opinion of my own on the subject, I think it will be well for the club to consider whether this system is likely to have been beneficial to its interests. The object of the arrangement was, no doubt, to give a popular character to the council, and a very good object it was; nevertheless, if you withdraw the names of men who have been most regular in their attendance and devoted the greatest attention to the proceedings of the club, and if you keep them for two years out of office, it is just possible that at the expiration of that period you may not be able to get them back again (Hear, hear). I readily admit that it is a great advantage to have an infusion of new blood; still it is a singular circumstance that some of the best members of the council had the misfortune to have their names withdrawn on the very first ballot, and that consequently the club has been deprived, at all events for a season, of their valuable services (Hear, hear). I may also mention that I understand the club has become very rich; so rich, indeed, that it will be a matter for the serious consideration of the council how they are to spend the money they possess (cheers and laughter). I believe it is proposed to give larger premiums; but whatever is determined upon, it is certainly very satisfactory to find that the club is in such a flourishing condition (cheers).

The Secretary then read the awards of silver cups to successful exhibitors.

Lord FVRSBHAM had been asked to propose a toast which he was sure they would receive with the warmest cordiality. It was "The Health of their noble President, Lord Walsingham" (loud cheers). His noble friend had been so fortunate as to obtain the silver cup for the best pen of Southdown sheep; and they were well aware that that was a department of the show in which upon former occasions he had been eminently successful (Hear, hear). Several prizes had been awarded to him on the occasion of the first meeting of the club in the Agricultural Hall; and at this, the second meeting there, his noble friend had had the honours of the show-yard literally showered upon his head: indeed, his celebrity in that department bore fair to rival the fame of the late Duke of Richmond, the lamented Jonas Webb, Mr. Rigden, and the other great Southdown competitors (cheers). They had sometimes heard unfortunately of agricultural distress; but he was sure it would be admitted on all hands that their noble president was a far better representative, both personally and practically, of agricultural prosperity (loud cheers and laughter).

The toast was drunk with three times three and great enthusiasm.

The CHAIRMAN said that, as the representative of agricultural prosperity (laughter) and Smithfield Club success, he begged to return thanks for the kind manner in which his health had been drunk. He confessed he had taken the greatest possible interest in the particular class in which he had now attained the highest honours, but he never expected to be able to rival the fame of the late Mr. Jonas Webb, or of the Duke of Richmond, or of Mr. Rigden. He knew he had got a good flock of sheep, and he would do his best to keep it in a state of perfection, and exhibit specimens of it at the shows of the Smithfield Club and the Royal Agricultural Society; but there were quick, keen, and intelligent men who would do their best to pull him down from the high position he now held (laughter); he would, therefore, not be disappointed if only he did not retrograde. Pride must have a fall at some time or another. His object had been to produce good wutton, and he began with a very moderate flock of Southdowns, and the success he met with at a local show had tempted him to venture upon competition at the exhibitions of the Smithfield Club and the Royal Agricultural Society (Hear, hear). The noble lord concluded by proposing the

health of Mr. John Overman, as the winner of the silver cup for the best pen of cross-bred long and short-wooled sheep.

Mr. JOHN OVERMAN, in acknowledging the toast, said that that was not the first time that he had sent stock to the yard. He had recently made up his mind never to come there again after that occasion, but having heard a hint thrown out that he could not win again he intended to try once more (laughter and cheers).

Lord BRUNNERS proposed "The health of the Presidents Elect for 1864 and 1865 respectively—Lord Tredegar and Earl Spencer." Lord Tredegar was, he observed, the President of two agricultural societies in the country, and was considered the patron of such societies in his own district; and few ever had done more to advance the science and practice of agriculture in the county of Monmouth. The President Elect for 1865 bore a name which must be dear to every member of that Society. Earl Spencer was the successor of one who for many years presided over that Society with the greatest advantage to it, and who did very much towards raising the Club from small beginnings to its present advanced state of prosperity (cheers).

Lord TREDEGAR, in responding to the toast, said he felt proud of having been elected President of the Club for the next year, and, however he might be wanting in ability, he certainly would not lack inclination to promote its interests.

Mr. C. STOKES, in proposing "The Vice-Presidents and Trustees," expressed his gratification at the election of Mr. Brandreth on the previous day to the office of Vice-President. Many years ago that gentleman performed the secretarial duties most efficiently, and if he had not occupied the office of Secretary at the time when Lord Althorp was the President, the Club could hardly have obtained that impetus which had helped to conduct it to its present satisfactory position. As to the Vice-Presidents, generally, although they were proud of their names, they would like to see more of them present on an occasion of that kind (Hear, hear).

Lord BRUNNERS, in acknowledging the toast, congratulated the company on the present position of the Club, remarking that an alteration had been made in the mode of electing the judges which had given satisfaction, that the balance-sheet for the year exhibited a surplus of £4,800, that the entries this year exceeded those of last, that the number of prizes had been increased, and that they were able to increase it still further in another year (cheers). Politics were not discussed at these meetings; but he thought he might say, without infringing upon that rule, that as the object of the Club and of the Royal Agricultural Society was to produce meat of the best quality at the lowest possible price—a work of great national importance—any representations they made on such a subject were entitled to some weight (cheers). The farmers of England had, he considered, a just claim upon the Legislature for the repeal of the malt-tax; and if they were united as they ought to be, the satisfaction of that claim could not long be deferred (cheers). Another matter of interest was that of steam-ploughing—a subject which had been considered that day at an important meeting at St. James's Hall. There the question at issue was, could it be done more economically and efficiently than horse-ploughing? He himself had had some experience in steam cultivation, and he did not hesitate to say that, if they would apply the same amount of intelligence to the selection of implements for cultivation, best suited to the soil, climate, and peculiarities of their farms, that they brought to bear upon the breeding of stock and the management of their crops, they could cultivate the land more efficiently and more economically, and that at times when it would be impossible to carry on their operations by any other means. He trusted, therefore, they would set their shoulders to the wheel, and encourage steam culture to the best of their ability (cheers).

The CHAIRMAN said it had been suggested that farmers ought to combine together to buy a steam plough for their joint use. The other day he was in a parish in Scotland where there were three farmers, each of whom had a steam cultivator of his own. It was in the East Lothians—a rich district, where farmers always seemed to be very much in advance of farmers generally.

Mr. TORR proposed "The Judges," who, he had no hesitation in saying, had, amid all the difficulties which they had to encounter, done their duty (cheers). Having occupied that position himself more than a hundred times, he well knew what a strong disposition there often was, in some

quarters, to find fault; but on that occasion there did not appear to be any cause for dissatisfaction. There was one question to which he would now briefly allude, because he believed it required to be ventilated—he alluded to the question of public judging. He had always been an advocate for it, and had been mainly instrumental in its being adopted by the Royal Agricultural Society, and he hoped he should live to see it exemplified in that Club. The new building was admirably adapted for it, on account of the galleries; and the matter might be so arranged that the judges would not be interfered with, in the performance of their duties, while others were looking on. He had no idea of anything of that kind being done in a corner (Hear, hear). He maintained that a judge could make up his mind just as well in five or ten minutes as in half-an-hour, and had the greatest horror of the use of anything like tape or a two-foot rule (Hear, hear). In conclusion, he desired to draw attention to the falling-off in the annual dinner. Some years ago, as many as 300 gentlemen assembled round the tables in that room, whereas there were not 60 then present; and he would suggest that, as the dinner was a failure, it was worth consideration whether it ought not to be discontinued (Hear, hear, and expressions of dissent). Well, he certainly thought that when there were only 60 gentlemen from all England at the anniversary festival of the Smithfield Club, the dinner might safely be called a failure. The number had for some years past been growing gradually smaller, and something must be done in the matter.

Mr. FISHER HOBBS, in proposing "The Stewards," the value of whose services must be felt by all the exhibitors, said he had had the pleasure of attending the annual dinner for more than thirty years in succession. He believed it to be his duty to attend as soon as he became an exhibitor, and he should have thought that nothing could be more pleasing to successful exhibitors at all events to attend there to receive the medals and honours awarded to them (Hear, hear). When Lord Spencer and the Duke of Richmond presided at the dinner the room was hardly large enough to contain those who attended; but he was sorry to say that that was far from being the case on that occasion. Perhaps this change was partly attributable to that mighty power—steam. In former days when a man went to attend the Smithfield Club Show, he came to London for the week, and returned home by coach on Saturday; whereas now many farmers come up for one day to see the Show, and returned the next. But that was not the case generally with the exhibitors, or at all events the successful exhibitors, and it was a poor compliment on their part to the Smithfield Club and the noble lord who presided not to attend the dinner, as persons in their position did formerly (cheers). He could not, however, agree with Mr. Torr that the annual dinner should be given up (Hear, hear). As a practical farmer, he thanked Lord Berners for mentioning two or three practical subjects, more particularly one relating to the production of meat, which now occupied so much of the attention of the farmers of this country. It was well known that wheat did not now pay for growing, but that the production of beef and mutton did; and this made it more than ever necessary that they should select those kinds of food which came most within their reach, being in fact the production of their own soil, to feed their cattle and sheep (Hear, hear). He certainly did feel that that was a subject of great importance; and he thought the attention of the British farmer ought to be especially directed to it at those annual exhibitions; for there they saw how peculiarly different breeds of animals were suited to different climates and soils—a very important point in reference to the question of feeding. He agreed with Lord Berners, that if the farmers of England were of one mind with regard to the malt-tax, the legislature could not much longer retain it (cheers).

Mr. KEARY, in responding, said he thought that whatever might be said with regard to the non-attendance of the members generally on that occasion, those who held an official position had been guilty of a dereliction of duty and a want of due respect for the President by absenting themselves. He concluded by proposing the health of the Honorary Secretary, Mr. Brandreth Gibbs, observing that the Stewards were greatly indebted to that gentleman for the excellent arrangements of the present show.

The toast having been drunk with great cordiality,

Mr. BRANDRETH GIBBS, in responding, said he found himself rather in a dilemma, because the new constitution of the Club had made it necessary for the Council to present a report to the members. It had naturally become his duty as Secretary to go over all the chief points which would be embodied in a report, and hence in preparing that report he might be fairly said to have cut the ground from under his own feet, and to have used up all the materials from which he might have spoken. It only remained for him, therefore, again to return his best and most sincere thanks, and to assure them that so long as his services could be of any value to the Club, they would always be placed heartily at its disposal. He concluded by proposing "The Agricultural Hall Company," coupling the toast with the name of Mr. John Giblett, who he said might fairly be regarded as the founder of that company (cheers).

Mr. GIBLETT, in responding, accounted for the absence of the Chairman of the Agricultural Hall Company by mentioning that he was so unwell as to be confined to his house, and for that of several of the other Directors by the duties which they had to perform in connection with the show. As to the success of the undertaking which he represented, it was in a great degree owing to the late lamented Jonas Webb (Hear, hear). He could only say on behalf of the Company that it would always be their pleasure and duty to study the convenience of the Smithfield Club as far as possible, the interests of the two bodies being, in fact, mutual. In conclusion, he expressed his regret that by the accident of the ballot the Chairman of the Agricultural Hall Company, Mr. John Claydon, and the Vice-Chairman, Mr. Shuttleworth, had both been removed on the previous day from the Council of the Smithfield Club, adding that he hoped the Club would be again represented by those gentlemen (cheers).

Professor SIMONDS proposed "The Father of the Club, Mr. C. Tower, of Weald Hall, Essex"—a toast which was most heartily received.

Sir J. H. MAXWELL then gave "The Royal Agricultural Society of England; success to its next meeting at Newcastle, and the health of Lord Faversham, its President" (loud cheers).

Lord FAVERSHAM: Gentlemen, the duty devolves upon me of offering my best thanks for the toast which has been proposed by the hon. and gallant baronet on my left hand, and the cordial manner in which you have received it. It is to me a source of sincere gratification to be able to inform you that after the meeting in Haover-square this morning had closed, a letter from General Knollys was forwarded to my residence, being addressed to me as the President of the Royal Agricultural Society, which intimated that his Royal Highness the Prince of Wales had graciously declared his intention to become a Governor of that Society (loud cheers). Had this information been received in time, the meeting would no doubt have expressed its delight at the prospect of having his Royal Highness enrolled as a Governor. Undoubtedly the first opportunity will be taken of electing his Royal Highness to that office, in accordance with his own desire, and I hope that at no distant period he will honour the Royal Agricultural Society by his presence at some of our country meetings. This letter certainly evinces his Royal Highness's great desire to uphold agriculture, and the deep interest which he feels in all that concerns it (cheers). I believe it is admitted by all that that Society has conferred great benefit upon the agriculture of this country, and that it has carried out the main objects contemplated by its founders. As regards the meeting next year, we hope and expect that there will be a great gathering, both from England and Scotland, and also from other parts of the world. The Society now reckons, I believe, a greater number of members than it has done at any former period, and its proceedings create universal interest. Not only has it directly promoted the interests of agriculture, but it has called into existence many other kindred institutions during the last quarter of a century; large county associations have been formed, many smaller societies established in rural districts, and there is now scarcely any district in the country which has not its agricultural society. As regards the holding of the annual dinner of the Smithfield Club at this time of the year I certainly cannot agree with Mr. Torr that it should be discontinued. I do not know whether that gentleman wishes that the dinner should take place in the summer; but I must say, as the result of experience, that a large dinner in the summer in this hall is a thing which the members of the Club would, in my opinion,

gladly escape from (laughter). At all events, if we are ever to have a dinner here in the summer, I trust it will be to commemorate the repeal of the malt-tax (loud and reiterated cheering). Let me add, that I believe that the Royal Agricultural Society has, in relation to classes of society which are not directly concerned in agriculture—being engaged in other branches of science, art, or production—exercised very considerable influence in stimulating habits of industry, promoting social improvement, and showing the advantages of a useful employment of time amongst the population of the country—a point of essential importance as regards the welfare and prosperity of the nation. These, gentlemen, are matters the importance of which it is almost impossible to overrate; they have formed the favourite themes of poets, philosophers, and philanthropists in all ages. You will perhaps, in conclusion, permit me to remind you how one of our own poets has beautifully illustrated and forcibly descanted upon the subject of the improvement of time in the following remarkable lines:

“The lapse of time and rivers is the same;
Both speed their journey with a restless stream:
The silent pace with which they steal away
No wealth can bribe, no prayers persuade to stay.
Alike irrevocable both when past,
And a wide ocean swallows both at last.
Though each resemble each in every part,
A difference strikes at length the musing heart.
Streams never flow in vain; where streams abound
How smiles the land with various plenty crowned!
But time, which should enrich the human mind,
Neglected, leaves a weary waste behind.”

The toast of “The Butchers” was then drunk, Mr. Giblett responding.

The CHAIRMAN said he had much pleasure in proposing the last toast, “The Health of the Labouring Classes,” on

whom they were in the main dependent for the cultivation of the farm and for nearly everything they produced (cheers). Whatever might be said of steam cultivation and the improvements in machinery, they could never do without farm labourers. But this might be said in favour of cultivation by machinery—that it had raised up a class of skilled labourers far superior to those who alone were formerly seen on farms (Hear, hear). Now they found many farm servants competent to take the place of engineers and workers of intricate machinery. Thirty years ago the labouring classes in the agricultural districts thought that the introduction of threshing machines would be injurious to their interests. There was almost an insurrection in the southern and south-western counties, and he remembered the breaking of machines by the mob, the holding of special circuits and sessions, and even the condemnation of persons engaged in those disturbances for murder. Now an entirely different feeling prevailed, and the labouring classes rejoiced at the introduction of these machines, knowing that they were an advantage to themselves as well as to the owners. The result was that a far greater number of agricultural labourers were in a good position now than in former years. The dwellings of those classes had recently become a subject of much discussion. He did not hesitate to say that this question had received the greatest attention on the part of English landlords in general. Never before had so good a feeling prevailed upon it among them. Parties had gone about the country and picked out the worst cases, and had made representations which did not truly describe the real state of the country in regard to this matter. He admitted that a great deal remained to be done; but, as a good spirit was abroad, he did not doubt that an improvement would soon be visible in the dwellings of the labouring classes (Hear, hear).

The company broke up about half-past nine.

THE GREAT CHRISTMAS MARKET.

LONDON, MONDAY, Dec. 14.—A remarkably fine season for the production of live stock, a very high range in the value of food, an abundant supply of grass, turnips, &c., in most parts of the United Kingdom, and a continued increase in the demand for butchers' meat, notwithstanding the amount of distress which has so long prevailed in the cotton districts, combined to produce one of the finest shows of beasts for Christmas consumption in to-day's market almost ever witnessed. Perhaps, indeed, we are justified in saying that the supply, taken collectively, was never equalled. Much has been said of the value and importance of the now-extended system of crossing, both in a productive and monetary point of view. We freely admit that judicious crossing has produced important results to the country generally; nevertheless, we were much gratified to find the pure breeds of the country so well represented, because we may still calculate with safety upon purity and stamina for future breeding purposes. From the large number exhibited we may, in the first place, refer to the Shorthorns as a distinct breed. They were certainly quite equal to all former shows, both as regards symmetry and quality. With very few exceptions, this distinctive and important breed showed signs of great weight. There were fewer “staggy” animals amongst it than on some previous occasions, and the prices realized for them were, in our opinion, highly remunerative. It will be perceived, therefore, that the Shorthorns have supported their great reputation as wonderful stock for general consumption.

In dealing with the Devons, we find much to be satisfied with. They were in somewhat greater force than in the last two years, and well suited for West-end consumption. Perhaps the best portion of the supply were 40 North Devons, the property of Mr. Senior, of Broughton House, near Aylesbury. These animals weighed from 140 to 200 stones each—an unusually great weight for North

Devons—and excited the admiration of the most experienced butchers. There were a few what may be termed middle beasts from the West of England; but the supply from that quarter, as a whole, was remarkably fine.

The show of Herefords was unusually prime, and the number was rather on the increase, especially from our best grazing districts.

With Scots from Scotland the market was well supplied; indeed, we may observe that this breed exhibited points of great excellence. As usual, Mr. M'Combie, of Tillyfour, was a most important exhibitor. That gentleman forwarded no less than 62 pure Scots, viz., 37 to Messrs. Maidwell and Hoyland, and 25 to Messrs. Giblett and Son. There were no young animals amongst them, and the whole found buyers at high quotations. The Norfolk and Suffolk horned and polled Scots came to hand in splendid condition, and were easily disposed of.

There was a good sprinkling of Beasts from Sussex, in full average condition. We had hoped, from the appearance of the show-yard, to see a larger number of young animals; but we found most of the stock, though wonderfully ripe, not suited to first-class consumption. In our opinion, Sussex, though not what may be termed a great stock-producing county, could turn out year by year a large number of Beasts from two to three years old. Many of the Beasts shown on this occasion were six, seven, and eight years old, and had evidently been worked.

There was a large and fine collection of Welsh runts, when compared with some previous seasons. It is satisfactory to find this description of stock coming forward more freely to meet consumption. We ourselves are at a loss to imagine upon what grounds the breeders have partly abandoned so important a breed, unless they find it more advantageous to adopt the crossing system, and thereby produce early maturity.

The stock from Ireland presented no room for special

comment. As usual, its quality was but middling, and sales progressed slowly.

The number of crosses considerably exceeded all former years. Almost every county in England, but more especially Norfolk, Suffolk, and Cambridgeshire, was well represented in this respect; whilst at least two-thirds of the best from Scotland were cross-breeds. The display was certainly a wonderful one. Even quality and fine condition were the leading characteristics; but, in our opinion, the most valuable crosses were those between the Scots and Shorthorns, which, in numerous instances, realized quite as much money as the pure breeds.

The following return shows the number of Beasts exhibited, and the prices realized for them, on the Great Days in the last twenty-two years:—

YEARS.	BEASTS SHOWN.	PRICES.				
		S.	D.	S.	D.	
1841	4,509	3	8	to	5	0
1842	4,541	3	4	to	4	8
1843	4,510	2	8	to	4	4
1844	5,713	4	0	to	4	6
1845	5,326	3	6	to	4	8
1846	4,570	4	0	to	5	8
1847	4,282	3	4	to	4	8
1848	5,942	3	4	to	4	8
1849	5,765	3	4	to	4	6
1850	6,341	3	0	to	3	10
1851	6,103	2	8	to	4	2
1852	6,271	2	8	to	4	0
1853	7,037	3	2	to	4	10
1854	6,181	3	6	to	5	4
1855	7,000	3	8	to	4	2
1856	6,748	3	4	to	5	0
1857	6,856	3	4	to	4	8
1858	6,424	3	4	to	5	0
1859	7,560	3	6	to	5	4
1860	7,860	3	4	to	5	4
1861	8,040	3	4	to	5	0
1862	8,430	3	4	to	5	0

Mr. George Dickson had many large consignments of excellent animals from Scotland. They were forwarded by Messrs. Martin, Knowles, Wihart, Kidd, Longmore, Stodart, Beddle, Reid, Frost, Mitchell, and other extensive graziers.

Mr. Vorley had a very prime show of stock from Scotland, Norfolk, &c.

Mr. Thomas Martin's stand was well filled with fine Beasts, among which were three Shorthorned steers bred and fed by Mr. John Gamble, of Shouldham Thorpe, Norfolk.

Besides those above referred to, Messrs. Giblett and Son had on sale some remarkably prime Scots, forwarded by Mr. A. Mennie, of Aberdeenshire, and other graziers.

At the stand of Messrs. Morgan and Allday we observed a noble collection of stock, chiefly from Norfolk.

Various other salesmen had a fine show of Beasts, but we must observe that there were fewer heavy animals amongst it than in some former years. On the whole, however, the supply was remarkably even, considering the enormous number in the market.

The exhibition of Sheep was extremely good as to quality, and the number was a fair average one.

Messrs. Lintoll and Son had some superior Sheep, Hampshire Downs, the property of Mr. Paul, of the Isle of Wight. Other prime Sheep were forwarded by Mr. Bates, of Harpenden, and Messrs. Franks, Jones, Hoare, &c. Mr. John Weall exhibited some very prime Sheep from Hertfordshire and other counties.

Mr. Charles Burrell had on sale some splendid Hampshire Downs, from W. B. Canning, Esq., of Devizes; Earl Darnley, Kent; Lord Lucan, &c.

Mr. Gurrier's stand was well fitted with Cotswolds from

the flocks of Messrs. Hewer, Craddock, and others; also with some very superior Dutch Sheep, the produce of a first cross with a Cotswold ram.

Messrs. Eland and Son, Mr. Woodward, and Mr. Hancock had an excellent show from Lincolnshire and other counties. The weight of some of the animals was enormous.

Mr. Dodd had some very good Hampshire Downs, belonging to Messrs. Wetherington, Righton, Reading Hodges, Dodd, and Beasley. Mr. Mawer exhibited three superb Hampshire Downs. The same number was shown by Mr. Lathbury, from the flock of Mr. W. F. Bennett, of Chilmark, near Salisbury.

Mr. B. Weall had some very good Sheep from various quarters.

STATE OF THE TRADE.

The supply of Beasts being unusually large, and of remarkably even quality, the demand for nearly all breeds was in a sluggish state. However, compared with Monday last, very little change took place in the quotations. A few very superior Scots realized 5s. 2d.: but the general top figure for Beef was 5s. per 8lbs.

Prime Downs and half-breeds moved off steadily, at very full prices—the general top quotation being 6s. per 8lbs. Otherwise, the Mutton trade was heavy, at a decline of 2d. per 8lbs.

Calves were in short supply. No quotable change took place in prices; but the Veal trade was heavy.

In Pigs very little was passing, on former terms.

The arrivals from Lincolnshire, Leicestershire, and Northamptonshire, including Warwickshire, amounted to about 2,500 shorthorns, crosses, &c., from various parts of England, including Devonshire, 2,200 Devons, Herefords, runts, &c.; from Norfolk, Suffolk, Essex, and Cambridgeshire, 1,600 Scots and crosses; from Scotland, 1,800 Scots and crosses; and from Ireland, 800 Oxen and Heifers.

There was a fair show of Spanish and Portuguese Beasts. The supply from Ireland was only middling in quality.

Per 8 lbs., to sink the offal.

	s.	d.	s.	d.	
Coarse and inferior Beasts	3	6	to	3	10
Second quality ditto	4	0		4	6
Prime large Oxen	4	8		5	0
Prime Scots, &c.	5	0		5	2
Coarse and inferior Sheep	4	0		4	6
Second quality ditto	4	8		5	2
Prime coarse-woolled ditto	5	4		5	8
Prime Southdown ditto	5	10		6	0
Large coarse Calves	4	0		4	8
Prime small ditto	4	10		5	0
Large Hogs	3	6		4	2
Neat small Porkers	4	4		4	8

Suckling Calves 15s. to 25s.; and Quarter-old store Pigs 20s. to 26s. each.

COMPARISON OF THE GREAT DAYS.

STATEMENT AND COMPARISON OF THE SUPPLIES AND PRICES OF FAT STOCK EXHIBITED AND SOLD IN THE GREAT METROPOLITAN CATTLE MARKET ON MONDAY, DEC. 15, 1862, AND THIS DAY, MONDAY, DEC. 14, 1863.

Per 8 lbs. to sink the offal.

	Dec. 15, 1862.		Dec. 14, 1863.								
	s. d.	s. d.	s. d.	s. d.							
Coarse and inferior Beasts	3	4	to	3	6	to	3	6	to	3	10
Second quality do.	3	8		4	0		4	0		4	6
Prime large Oxen	4	2		4	8		4	8		5	0
Prime Scots, &c.	4	10		5	0		5	0		5	2
Coarse and inferior Sheep	3	8		4	0		4	0		4	6
Second quality do.	4	2		4	8		4	8		5	2
Prime coarse-woolled do.	4	10		5	4		5	4		5	8
Prime Southdown do.	5	6		5	8		5	10		6	0
Large coarse Calves	3	6		4	2		4	0		4	8
Prime small do.	4	4		4	6		4	10		5	0
Large Hogs	3	4		3	10		3	6		4	2
Neat small Porkers	4	0		4	4		4	4		4	8

SUPPLIES ON SALE	Dec. 15, 1862.	Dec. 14, 1863.
Beasts.....	8,480	10,570
Sheep.....	20,900	26,290
Calves.....	178	180
Pigs.....	490	360

SUPPLIES ON SALE	Dec. 16, 1861.	Dec. 17, 1860.
Beasts.....	8,840	7,860
Sheep.....	26,300	19,550
Calves.....	202	210
Pigs.....	460	515

THE SMITHFIELD WEEK.

BY A YOUNG NORFOLK FARMER.

The sun this morning in London looked like a red wafer stuck on a sheet of brown paper, but no sooner did we journey into the country than we found it was a bright and beautiful day, with a pleasant and seasonable white frost. However, we have begun at the wrong end of our tale, and must begin at the beginning.

Getting up at five, and shaving in cold water, and driving through a mizzling rain on a December morning to catch the up express, is not over pleasant. And then, in London by 10.30, what can an anxious exhibitor do but wander towards the Great Agricultural Hall? where, of course, he arrives long prior to the time appointed for admission, hoping—vainly hoping—that private judging may have the one advantage of greater dispatch. So we are there early, but not alone; and we huddle together like a lot of play-going folk at the pit door of the theatre. There is plenty of time for reflection beyond wondering who has won the two great cups; and not caring to be squeezed too long at a time, we wander up and down that lonely Barford-street. We gaze on the great rough stones, the deep holes, and the thick rows of mud and dirt. We are the surveyor of our parish, and we thought if our roads had been in this state what a strong argument that would have been at the Norwich January Session for turning our Hundred into a District Board!

The doors at length open, and there is the usual little hubbub, struggle, and crush. Once inside the Hall, all is peace. We cast our eyes around that vast and splendid structure, and ask contemplatively whatever harm could result from the presence of some two hundred members of the Smithfield Club in those spacious galleries? We contend that the judges might not only be unmindful, but even unconscious of their presence. So we hope for better things before Christmas '64.

Now to the show. It was a *great* show if not a *grand* one. The Norfolk men, stimulated by having a Norfolk president, seemed inclined to outdo themselves. At any rate, they succeeded in winning 3 cups out of 5, 26 money prizes, a host of medals, and sundry "honourable mentions,"—more than they ever did before, and their signal success is certainly a triumph for one county. Again, in proportion to the Norfolk entries, great was the number of prizes. Mr. Heath showed only four animals and took 4 prizes, 2 medals and the grand cup. Mr. John Overman had 8 entries, and won a cup, 7 money prizes, 5 medals, and a high commendation. Mr. Wortley, with 3 beasts, gained 2 prizes—a medal, and was commended. Mr. Matthews' only entry of a shorthorn cow was first in her class. Mr. Oliver and Mr. Mullen, with their Norfolks, were both placed No. 1. The elder Wortley showed a cross-bred steer, and got a first place; and last, but not least, the noble President, with 3 pens of Southdowns, won the cup, 8 premiums, and 2 medals, besides taking a similar distinction with his pretty and symmetrical extra stock ewe.

Norfolk is not a breeding district, and yet, out of some 15 breeders' medals that were won, more than two-thirds are retained by the county. This demonstrates that there

is a little decent breeding stock in Norfolk, though our agricultural shows are by no means celebrated. Some people habitually turn up their noses at all fat stock shows, and say any one can feed a bullock. Let an outsider try if he has a chance against such graziers as Mr. Heath and Mr. Overman. It is necessary, of course, to get the right sort of stock to feed, but then it requires a great deal of knowledge, and a vast amount of care, skill, and perseverance to feed animals for successful exhibition. Our champion graziers seldom fail; mark the continued success of the two we have named, and consider well the vast amount of firm and fat meat they produce on a small frame, and yet preserve the animal in health and keep its form in proper proportion. This is no easy task. What these prize animals eat, and what they drink, we don't know, and therefore cannot tell, but we don't believe all the tales that are told of sugar and treacle, and porter and new milk.

The Devons were good this year, and the Herefords very commendable, but the male Shorthorns, especially the young sters, were a sorry lot, and if the Birmingham gold-medal ox was the best in his class, this year has produced no good fatting among the male Shorthorns. The Sussex still go a-head, and if the breeders on the sly send to Devon for *quality*, why don't some of the Devon men steal over to Sussex for *size*? They had better do that than run to the south of their own county, for the improved Sussex are certainly better shaped cattle than the South Devon. Our Norfolks made up a small class, but nevertheless contained two very good specimens. Mr. Oliver's was a beautiful ox, and without wishing to be rude to the breeder and grazier, if Mr. Heath, Mr. Overman, or Mr. Wortley had had this ox in hand, he might have been drawn out for the gold medal. We should have liked the Norfolk and Suffolk class to have been more uniform: we hear that two protests were lodged against two animals for not being purely bred. Had the Norfolk Agricultural Society done its duty and stuck to the true red as their only colour, our home-bred cattle would have long ago assumed a more uniform and reliable cast of character. The Scots were a prime lot, especially the Highlanders, but the cross-breeds were hardly up to the excellence of former years.

The Longwools were nowhere. How are the mighty fallen when the Cotswolds are pronounced unworthy of a prize! It may be a cruel act which withheld the prize, and yet it may do good. Some few Glo'ster men were very wroth; they declared that the only reason why the crack breeders did not exhibit fat wethers was that there was such a demand for their *rams*, that they saved every good male sheep they bred. This is a legitimate excuse, especially when we consider how many Cotswold rams are annually sold, and what prices they make. Mr. Overman's cross breeds were very good, quite up to the high mark of the Burnham sheep. But the Oxford Downs must have been poor for a juvenile outsider like Mr. Arthur Overman to run off with the first prize. It struck us that the Oxford Downs had thin legs and bad scrags, defects from which even the prize pen was not quite free; but the

old Shropshire sheep were particularly good, and certainly showed *two* better ends than the Oxford Downs.

All along we have said that the Merton flock would one day cut a dash among the Southdowns, and this year their success has been most signal, making, as they have, a clean sweep of all the prizes they showed for at Yarmo, at Hamburg, at Birmingham, and doing almost as much at Smithfield. A big Southdown must be better than a little one, and Lord Walsingham produces not only a large sheep but one of exquisite quality and perfect form. We don't think we ever saw a pen of Southdowns more to our mind than those that won the cup this year. They were well bred, and well fed, and *well trimmed* too; and if a prize for the best trimmed sheep was offered, we should back the Merton shepherd by long odds to win it. And what a beautifully moulded and pretty thing was the president's extra stock ewe! She was only a two-tooth, and looked as if she might have been one out of the Worcester prize lot. We don't like these pretty dears to be spoiled for a fat show; and though this one was not sold, and may go back to Norfolk as a flock ewe, she has lost her best year, and has been so pampered and petted that she may not like the bleak climate, or the poor wiry grass of Merton Park. If we had our mind, no ewe should compete in this class that had not had at least two lambs.

A Norfolk man heaves an envious sigh over the Smithfield pigs, and wonders why his county, with such good cattle and such decent sheep, should always be supplied with the worst pigs that can be found in the British Isles!

The show of the Smithfield Club was a great success; the dinner was a total failure. For more than three weary hours did we sit in that classic Hall of the Freemasons' Tavern. It may be a great treat to gaze on four live

Lords, a Scotch Baronet, and an Oxen M.P.; but we thought that paying 15s. for the sight, which certainly included a moderate dinner and a pint of ordinary wine, was, as things go, very dear. Not a word from the high table reached us; nothing to us was audible but the music and the big sonorous notes of the toast-master; and we had nothing amusing save the wonderful bodily contortions and erratic movements of one of the speakers at our end of the room. We stole away from the dinner, and rushed off to the Society of Arts, and were in time to hear a discussion, in which the chief speakers seemed to do all they could to discourage a system that had done so much to help them on the road to fortune.

The meeting of the Royal Agricultural Society was better attended than usual; and surely if the general members are ever to have any voice in the election of the Council, they should be appointed at that Christmas meeting rather than in May. And, moreover, if the Council ever wish to have full meetings of members, it would be well to give a larger and earlier publicity to the day and hour of such meetings. The gathering of the Smithfield Club was of a much more popular character; but the blessed ballot did all it could to black-ball the most useful and energetic members of the Council.

The Smithfield week is no exception to the fact which has become patent of late, that while shows increase and flourish, annual meetings and dinners are more or less shirked. It seems to be the fashion of the day to try and educate and enlighten the masses through the eye, rather than the ear; and as farmers are becoming fashionable they seem inclined to learn all they can in the Show-yards, but show little desire to listen to the lordly speeches and high authorities of the public dinner-table.

THE PRESENT ASPECT OF BRITISH AGRICULTURE.

The astonishing exhibition of fat stock at the Metropolitan Christmas market must convince every intelligent and inquiring mind that agriculture in this kingdom is progressing satisfactorily. The world never witnessed such a grand gathering of prime stock, such an immense number of extraordinary animals, so well fitted for the consumption of our wonderful metropolis. The exhibition well becomes the greatest city of the world, and testifies most unmistakably that British agriculture is quite in keeping with, and does honour to, the greatest nation upon the earth. How encouraging to every promoter of agricultural advancement! How gratifying to every lover of his country! How satisfying to every doubting mind! Go forward, then, ye rural workers, for your country's good. Spread your societies still wider and wider. Enlighten your neighbours further and further; select the best stock; breed from the best animals; fatten from the best sources; use the best foods; adopt the best management; do not flag in your exertions, and success is certain. Few even contemplated such a rapid increase. Twenty years ago about 4,000 head of cattle constituted a first class Christmas show. The actual number shown in the year 1841 was 4,609, in 1842 it was 4,641, in 1843 it was 4,610; and these years exhibited a slight increase upon preceding ones.

About this time the efforts of the Royal Agricultural Society of England and other kindred societies began greatly to influence the agricultural world. Every intelligent farmer became acquainted with other breeds than he himself or his neighbours patronized. Changes were soon resolved upon; improvements soon became general; better management soon manifested itself; earlier maturity of animals was soon obtained; quicker returns in animal economy induced more extensive breeding. Close attention was very soon given to suit the animal to the locality and climate; hence great advances were made in districts heretofore considered unsuited for cattle or sheep. The whole agricultural public has become fully aroused, and hence the

wonderful supply which it has provided for a nation's subsistence; for be it remembered that every country market has been pretty nearly as proportionately supplied as the metropolitan market itself.

It is well worthy of observation that a great and gradual increase has taken place from the very commencement of the Royal Agricultural Society's meetings. I well recollect the public excitement when the report of the Oxford meeting went the round of the papers. No one ever dreamt that England could produce such splendid animals as were there exhibited: they were not only to be seen to be admired, but to be at once imitated, and from that period great efforts have been unceasingly made in almost every district, not only to improve and propagate the best breeds already in being, but also to found and establish new breeds both of cattle and sheep by judicious crossing and selection. This has been effected to a very considerable extent, and with immense benefit; so that in fact it has not only led to an increase of numbers, but in surprising relative weights. Every breed of animals now attaining a heavier weight at an earlier age than formerly, which enables the breeder to rear or the grazier to fatten a much greater number annually than before these improvements took place. These remarks serve to show the causes of such great increase in our supplies for home consumption, and fully prove the surprising advancement made during the past twenty-five years. We will, however, take the fact of cattle exhibited in the Metropolitan Christmas Markets for the past twenty years in extra proof. They are as follows: In 1841, 1842, and 1843 the average number was 4,520; 1844, 5,713; 1845, 5,326; 1846, 4,570; 1847, 4,282; 1848, 5,942; 1849, 5,765; 1850, 6,341; 1851, 6,108; 1852, 6,271; 1853, 7,087; 1854, 6,181; 1855, 7,000; 1856, 6,748; 1857, 6,866; 1858, 6,424; 1859, 7,560; 1860, 7,890; 1861, 8,040; 1862, 8,430; 1863, 10,370—in reality there were 11,169 head of fat cattle, but the salesmen were so pressed for room on their respective stands

that it was impossible to make adequate room till some were sold, and "turned out." This unprecedented supply may in some measure be owing to the restricted demand for meat in the cotton districts. Be that as it may, the quantity shown on Monday last, both of cattle and sheep, exceeded by far all preceding Christmas markets. The weight of meat was enormous, and its collective value could not be less than £400,000. Such a market was never before seen. Nor will this course of management cease; on the contrary, it will go on increasing. The breeding, rearing, and fattening of farm stock has received such an impetus from enhanced prices, that every means was resorted to, to get up the stock at an early age for market. Artificial foods are supplied in untold quantity throughout the kingdom. Careful management in economizing and consuming the ordinary food of the farm is general. Nearly every root is cleaned and cut for the stock; yes, crops of 50 tons weight per acre—no little work for stock-keepers.

In this way these improvements will for years, or an indefinite time, proceed. But this is only a portion of the advancement made in agriculture: the arable department is progressing in a still more satisfactory manner. The amazing quantity of produce now yielded by the arable portion of our farms far outstrips the grazing portion, although not more profitable. On the better soils rotations are quite at a discount—in some districts abandoned. The liberal application of artificial manures, in addition to farm-yard manures, suffices to sustain an amount of fertility hitherto unknown. Crops of great weight and value are annually obtained by these artificial aids and enlightened management. Fallows, as fallows, are altogether discarded, because by the further aid of steam culture they can be effectually kept clean. The advancement of this mode of culture is greater and greater daily. Many hundreds of steam cultivating implements are now employed. One firm has supplied upwards of three hundred sets; another firm treads closely on the heels of its fellow, and has now on hand forty orders for home service. Other firms are making like progress, and all speak encouragingly. The advance is fully recognised; it has become popular—the great cost the only hindrance.

The present favourable season gives abundant evidence of the state of British agriculture, and proves that with suitable seasons prodigious yields will be forthcoming. Perhaps a more prolific harvest was never experienced by this country than the last; nor the grain of finer quality. Potatoes, too, are equally abundant, and of fair quality; the green crops in some districts alone being defective, in others most satisfactory. The great fact is this: Every occupier or cultivator of the soil has had such a sad, and perhaps salutary lesson, taught him during the last few years, that he sees his only chance of success in more enhanced production; and that at as cheap a rate as is commensurate with the requirements of his soil and crop: hence every reasonable improvement is adopted and practised with correct economy and rural skill; every department of labour is more skilfully performed; every crop is more carefully and properly put in; the land more liberally prepared to receive it; the crops selected for growth being of the best character, and the succession arranged after the best order and practice. The harvesting of all crops is now effected upon the best principles, particularly in the harvesting of root crops: these are now throughout the country got up with great judgment and care, being another proof of the high value put upon root culture. All these little matters show the bent of the agricultural mind, and denote progress, universal progress. The agricultural press has also had much to do in promoting this onward course. Readers are very many; knowledge is increasing—it is stable and good. In a word, farmers have only their own industry, judgment, and talent to trust to.

BATH AND WEST OF ENGLAND SOCIETY.

The monthly meeting of the Council of this body was held at Taunton. Present—Earl Fortescue (in the chair), Sir J. T. B. Duckworth, Bart., Colonels Acland and Mansel, Rev. T. Phillpotts, Drs. Gillett and Scott, Messrs. Bush, Danger, Dav, Farrant, Fry, Jonathan Gray, Hancock, Hussey,

Langdon, Poole, Williams, Manle (secretary), Goodwin (editor), &c.

A copy of the Society's Journal (vol. xi. p. 2) was laid on the table, and it was announced that in the course of a few days it would be received by all members whose subscriptions are not in arrears.

The special committee brought up a report on the subject of the admission of school children to the Society's annual shows. They recommended that they should be admitted before ten o'clock in the morning, at 3d. each, when in companies of not less than twenty each attended by a teacher, and that they should be required to leave the yard before one o'clock in the day, so as not to interfere with the convenience of exhibitors and visitors. The report was approved of, and the committee were authorized to adopt such measures as they thought proper for the carrying out of the proposed recommendations.

Dog Show.—The further consideration of the propriety of holding a dog show as an adjunct to the annual meetings of the Society, was by a unanimous vote deferred *sine die*.

SALE OF FAT STOCK IN WINDSOR PARK.—The sale of Her Majesty's Scotch oxen, fed in the meadows of Windsor Great Park, under the management of Mr. G. Gravatt, on bean-meal, cake, and hay, took place under the hammer of Messrs. Buckland and Sons, at Windsor. The beasts were in the finest condition, 25 of them rising six years old averaging over £27 each, a price much higher than has ever before been realized. Altogether there were 53; the highest priced ox was £36 10s., bought by Mr. Copeland, the Royal butcher. Several produced prices between £29 and £30.

DUKE OF BEDFORD'S ANNUAL FAT STOCK SALE.—This large annual fat sale took place at the Park Farm, Woburn, Beds; Mr. Robert Furze being again appointed by His Grace the Duke of Bedford to dispose of 66 fine Hereford, Devon, Highland, and cross-bred oxen and maiden heifers, 320 fat Dewa ewe, half-bred, shearing, three-year-old, Shropshire, Scotch, and two-year-old cross-bred wethers, and 40 fat pigs. There was an unusual number of buyers from the metropolis, and the prices made were considered to be very high. The sheep realized £1,136 2s.; Beasts, £1,978; Pigs, £172 10s.; Total, £3,277 12s. Average for sheep, £3 10s. 7d.; ditto, bullocks, £29 9s. 7d. Sheep: Shropshire Down shearing wethers made from £3 10s. to £3 15s. each, three-year-old Scotch wethers £3 to £3 10s., half-bred shearing wethers £3 10s. to £3 15s., 4-tooth cross-bred wethers £4 10s. to £4 13s. Cattle: Hereford heifers from £24 to £27 each, ditto oxen £27 to £29, Devon oxen £30 to £31 10s., Scotch oxen £24 to £28, a few reaching £29 to £30, Devon oxen £30 to £34, Hereford oxen £34 to £40, extra ditto £40 to £47 10s.

SALE OF SIR ANTHONY ROTHSCHILD'S FAT STOCK, at the Model Farm, Aston Clinton.—The sheep were first offered for competition, and the 160 four-toothed fat wethers realized £528 7s. 6d., averaging £3 6s. each. The thirty fat beasts, including some fine Scots, made £1,129 10s., averaging £37 12s. 6d. per head; six of them realized the enormous sum of £308, and it was computed that many of the beasts sold at the rate of 7s. a stone, or 10½d. per pound. Twenty-nine porkets, which were of fine quality, made £118 14s. 6d., averaging £4 each. The largest buyer was Mr. Shipland, of Knightsbridge, London; and the other principal buyers were Mr. Slater, Kensington, London; Mr. Cowell, Knightsbridge, London; Mr. R. Wright, Aston Clinton; Mr. Crawley, Luton; and Mr. George Wright.

COLEY FARM, NEWPORT, SALOP.—The usual sale of fat stock, the property of Sir T. F. F. Boughey, Bart., took place on Monday, Dec. 7. The cattle (which were very choice and ripe, but not so large as usual) sold well, the average price for the sixty-two head being £24 10s. The sheep and pigs also fetched advancing prices. Many of the trade remarked that there never was a better sale at Coley. The total amount realized by Messrs. Holland and Sons, the auctioneers, in about two hours, was nearly £2,000.

THE METEOROLOGY OF DECEMBER.

The last four days of November continued fine, the barometer showing a tendency to decrease, although slowly; whilst the wind blew gently from the E. or S.E. The mean temperature on the 27th was in excess of the average value to the amount of 4° , whilst the other three days of the month were in defect to the mean amount of 4° , the absolute deficiency on the 30th amounting to $6\frac{1}{2}^{\circ}$.

On the 1st of December the barometer began to fall very rapidly, reached 29.46 inches by night, and the minimum value of 28.84 inches on the morning of the 2nd, indicating by its rapid decline an impending gale. The wind commenced blowing with great and sudden force after 2 p.m., and soon reached a pressure of 10lbs. About 3 p.m. a great gust of $22\frac{1}{2}$ lbs. was registered, and the wind continued blowing with great force till $3\frac{1}{2}$ p.m., generally between 10lbs. and 15lbs. The barometric column was meanwhile rising rapidly; by $9\frac{1}{2}$ p.m. the reading 29.38 inches was reached, and it remained at this value till 11 p.m., then again turned to decrease rapidly, presaging a recommencement of the gale. By 7 a.m. on the 3rd, a minimum value of 28.80 inches was again reached, and soon after, whilst the barometer was still at its lowest value, the maximum force of the gale was reached, namely, 21lbs. on the square foot. The wind also slightly changed its direction at the same time from S.W. to W., and continued to blow forcibly from the latter direction for many hours, recording pressures varying between 6lbs. and 12lbs. During the remainder of the day the barometer rose steadily, and at times rapidly, reaching 29.1 inches by noon, 29.4 inches by 6 p.m., 29.8 inches by midnight, and by noon on the 4th day it reached 30.22 inches (a maximum value). Thus, an increase of 1.42 inches took place within 28 hours, or at an average rate of increase of 0.05 inch per hour, whilst during several hours the rate of increase was still greater, amounting to 0.08 inch. The rapid motion of the air tended to produce greater atmospheric dryness, and we find therefore that the degree of humidity, which had previously exceeded 90, decreased on the 3rd to 66, and was not much greater on the 4th, when it was 78.

The temperature was generally high on the four first days of December, although not excessively so, the mean temperature values for those days exceeding their averages by the mean amount of $1\frac{1}{4}^{\circ}$. Rain fell in squalls also during the gales of the 2nd and 3rd, to the collective amount of three-quarters of an inch.

From the 5th to the 15th a very warm period ensued, during which the average excess of mean temperature values amounted to no less than $5\frac{1}{2}^{\circ}$, whilst on the 12th the excess was $10\frac{1}{2}^{\circ}$, and on

the 5th, 7th, 8th, 9th, and 11th days the amounts of excess varied between 7° and 8° . During this period the atmosphere was somewhat damp, and clouds were generally prevalent.

The barometer decreased to a minimum value on the 16th of 29.6 inches, and then increased rapidly to 30.34 inches by the 18th; the wind meantime changing to N. The effect of this change in direction of the wind was to produce for a short time colder weather, and the mean temperature for the 18th fell below its average to the amount of 3° . But with a falling barometer the wind returned to the W., and warm weather again ensued, which continued till the end of our period, and the amounts of excess above the average values were as follows: on the 26th, 11° , 24th and 25th nearly 8° , and the 21st, 5° ; of the other days, the 20th, 23rd, and 27th, exceeded their averages by small amounts, whilst the 22nd fell below its average, likewise by a small amount. The 27th day was very dry, the degree of humidity amounting only to 63° .

By examining the tables of results the following facts are easily deduced, namely, that the highest barometer reading occurred on the 18th of December, and was 30.34 inches; the lowest was 28.80 inches, on the 3rd, giving a range for the month of 1.54 inches. The highest temperature in the shade was 54.2° on the 3rd, and the lowest 26.5° on the 23rd; making a range of 27.7° . The highest reading in the rays of the sun was 78.2° on the 28th of November: the lowest on the grass was 16.2° on the 23rd of December. The dampest days in the month were the 1st and the 21st: the driest days in the month were the 3rd and 27th. The total amount of rain collected from the 27th of November to the 27th of December was 0.90 inch—an extremely small amount. The number of days on which a measurable amount of rain fell only amounted to six days. The past month, therefore, has been marked by the following characteristics: firstly, by excessive warmth throughout; secondly, for undue prevalence of S.W. and W. winds; and, thirdly, for an excessively small quantity of rain. With reference to the temperature, it may be remarked that the mean for the 31 days exceeded the average for the same period by no less an amount than $3\frac{1}{2}^{\circ}$; and with regard to the greater prevalence of S.W. and W. winds, it will be seen by referring to the tables that they prevailed at least during three-fourths of the month.

The past month has, therefore, been generally favourable to the progress of agricultural operations; and fortunately so too, as there now appears every probability of a speedy change to severer weather.

METEOROLOGICAL ELEMENTS FOR THE NEIGHBOURHOOD OF LONDON;
FROM NOVEMBER 27TH, TO DECEMBER 27TH, 1863.

Month and Day.	Temperature of the Air in Shade.			Highest Reading of a Thermometer in the full Rays of the Sun.	Temperature of Vegetation.*	Degree of Humidity. (Saturation=100).	Amount of Cloud, 0 to 10.	Amount of Rain.	General Direction of the Wind.	Weather Remarks.
	Highest	Lowest.	Mean.							
1863.	°	°	°	°	°			Inches.		
Nov. 27	50.0	40.3	45.6	64.7	33.0	91	8.0	0.00	S.E.	Generally cloudy
28	46.5	35.7	41.0	78.2	32.9	86	2.3	0.00	S.E.	Few clouds; fine
29	45.6	31.8	36.8	63.0	23.5	91	1.7	0.00	S.E., E	Dense fog morning: fine aftern. and evn.; h. frost
30	42.0	32.2	35.4	55.0	17.7	91	2.3	0.00	E., N.E.	Fine, few clouds; hoar frost
Dec. 1	51.7	30.2	43.7	52.0	22.8	95	10.0	0.04	SE., S.W.	Overcast; thin rain
2	51.3	38.8	45.4	58.0	33.0	92	7.5	0.04	S.W., N.W.	Ovrctst.; cl. nt.; gale & rain
3	54.2	35.9	42.6	67.6	25.2	66	2.5	0.30	S.W., NW.	Rain; fine; gale
4	46.0	33.7	41.4	63.0	25.4	78	5.0	0.00	W., S.W.	Fine morn.; cloudy evng.
5	53.0	44.9	49.3	74.8	40.0	84	10.0	0.01	S.W.	Overcast; a little rain
6	47.0	38.3	42.4	55.0	29.0	82	2.0	0.04	S.W.	Partially cloudy; haze
7	51.1	40.7	47.7	55.5	34.2	83	7.5	0.00	S.W.	Fine morn.; then cloudy
8	50.6	44.8	48.1	56.6	40.0	77	10.0	0.00	S.W.	Overcast; thin rain
9	52.1	43.9	47.7	53.5	42.7	93	10.0	0.08	S.W.	Ditto; gloomy after.; rain
10	48.2	34.8	42.9	70.0	26.3	86	4.5	0.00	S.W.	Fine; generally clear
11	50.8	43.9	48.0	53.0	40.2	85	10.0	0.00	W.S.W.	Overcast
12	53.5	47.7	50.4	60.1	43.0	86	4.0	0.00	W.S.W.	Fine; few clouds; haze
13	49.1	35.5	42.0	53.2	27.3	86	2.0	0.00	N.W., S.W.	Fine; few clouds.
14	49.9	36.2	42.9	63.2	28.9	91	0.3	0.00	S.W.	Generally cloudless
15	47.5	37.7	44.4	48.5	27.3	92	10.0	0.00	S.W.	Overcast
16	50.2	36.7	44.0	68.7	36.0	78	6.3	0.00	S.W., W.	Partially cloudy
17	45.2	36.5	42.1	51.2	29.4	72	10.0	0.00	W., N.W.	Generally cloudy
18	41.3	32.2	36.9	57.0	26.6	82	5.5	0.00	N., N.N.W.	Fine, few clouds; overcast
19	48.2	35.0	42.6	54.5	30.3	92	7.5	0.00	W.S.W., W	Partially cloudy
20	43.0	36.5	40.7	45.2	30.5	84	8.3	0.00	W.	Partially cloudy
21	48.8	37.7	43.4	57.2	32.1	95	10.0	0.00	W.	Overcast; a little thin rain
22	48.8	30.3	36.7	57.5	20.0	68	2.5	0.00	N.W.	Partially clear; hoar frost
23	48.5	26.5	40.4	54.5	16.2	90	8.2	0.00	W.	Generally cloudy
24	47.9	41.1	44.7	51.0	30.8	86	9.5	0.00	W.	Generally overcast
25	48.5	40.3	44.4	50.0	38.0	76	0.0	0.00	S.W.	Clear day; clouds at night
26	51.9	39.3	47.4	56.5	29.8	96	10.0	0.00	S.W.	Overcast
27	49.8	32.9	38.5	50.0	23.0	63	5.7	0.00	N.W.	Cloudy morn.; clear ngt.

* The "temperature of vegetation" is that obtained from a self-registering thermometer placed on the grass at night. It is therefore a minimum reading for the previous twenty-four hours.

TABLE SHOWING THE PRINCIPAL FLUCTUATIONS IN THE ATMOSPHERIC WAVE, FROM
NOVEMBER 27TH TO DECEMBER 27TH, 1863.

1863. Month, Day, and Hour.	Reading of Barometer.*		1863. Month, Day, and Hour.	Reading of Barometer.*	
	Highest.	Lowest.		Highest.	Lowest.
	Inches.	Inches.		Inches.	Inches.
Nov. 27, 9 a.m. ..	30.23		Dec. 14, 9 a.m. ..	30.29	
Dec. 2, noon ..		28.84	" 16, 9 p.m. ..		29.62
" 2, 9 p.m. ..	29.38		" 18, 3 p.m. ..	30.34	
" 3, 7 a.m. ..		28.80	" 22, 9 a.m. ..		29.70
" 4, noon ..	30.22		" 22, 9 p.m. ..	30.09	
" 5, 3 p.m. ..		29.93	" 23, 3 p.m. ..		29.82
" 7, 9 a.m. ..	30.24		" 24, 9 p.m. ..	30.12	
" 9, 9 a.m. ..		29.87	" 26, 9 p.m. ..		29.72
" 11, 9 a.m. ..	30.10		" 27, 9 p.m. ..	30.07	
" 12, 3 p.m. ..		29.94		(still rising.)	

* All the readings are reduced to the constant temperature of 32 degs.

CALENDAR OF AGRICULTURE.

This month is the best time for ploughing leys for Lent crops, as before the sowing of grains, as oats, beans, and peas, the surface has been pulverized by exposure, and not sufficiently long in a ploughed state to be hard and battered. The ploughing must be vigorously pursued during this month—of lands for spring, and of stables for fallows.

When frosts and snows prevail, cartings of all kinds will be done—of stones to drains and roads, of fuels to all householders on the farm, and of dung from the cattle-yards to the fields, where it will be wanted for the root crops. Place the heap in a lane, or in a convenient part of the field; make it an oblong-square shape, sloping at the ends to allow the loaded carts to pass upon and over it. Spread each load evenly over the heap, of six feet in height, and lay earth on the edges. The heap should have a dry foundation, and be level.

To whichever of the above operations the force of the farm be applied, let it be combined; let no detachments be made, except from necessity, which will sometimes occur, but must be avoided as much as possible.

In fresh weather continue the cutting of copses and underwoods, the cutting and plashing of hedges, the securing of ditches and road sides, and clear water-courses; cut drains to half the depth, to be finished in summer. Float water-meadows, and lay dry occasionally. Sow winter and spring wheats on lands cleared of turnips and fallows missed in autumn.

Collect and prepare artificial manures, and keep them under a dry open shed.

The live stock on the farm, of every kind, will demand the most constant attention and care of the farmer, if he would rear animals to profit and derive advantage from his labours, never forgetting the great effects of minute care in increasing the produce of a farm. Supply the cattle in the yards and horses with fresh straw daily, and give turnips and other roots in the morning, that the cattle may eat during day-light, and be seen when choked or swollen. Turnips are best fresh-drawn from the

field daily, as wanted; but the danger of heavy snows covering them from use renders necessary a heap at the homestead, containing a few weeks' supply. The yards must be littered frequently with straw, evenly and thinly.

The milch cows now begin to drop calves; feed with succulent food, with steamed roots and chaff. Suckle both veal calves and for weaning; disregard the old maxim that animals must be starved in order to be reared at little cost; when milk is exposed, the most valuable parts, the gaseous fluids, go off by evaporation, hence the superiority of suckling over hand-feeding. If any dairy produce be wanted use a portion of the cows for that purpose, and the others for weaning calves. Allow ample food in every case. Have the calf-pens divided into single apartments about 4 feet by 8 feet, opening into the cow-shed, from the end or from behind, if the width of the shed admit.

The sheep flocks must have fresh turnips daily from the field, rooted, but not topped, in the separate fields of different flocks, as ewes, keeping flock, and fattened flock, as arranged after autumn. The lambs of the last year and the fattening flock may be confined on the growing turnips, or be fed on ley or stubble-field. A two-horse cart load will suffice for forty in fattening, and for 100 in store of ordinary-sized animals.

Feed farm-horses with cut chaff of clover and straw, oats and beans, and give a hot meal of steamed potatoes or barley when done work in the twilight.

The piggery must not be neglected. Feed largely, and litter amply. Rear the store pigs with roots, as potatoes and beet, raw; the fattening hogs with steamed roots, chopped and mixed with meals, served regularly thrice a-day. No animals repay attention better than pigs.

Feed poultry with light grains and stewed potatoes, mashed and mixed with meals, placed in a shed under cover, and have the lodging-house comfortably fitted up and warmed, if possible. Separate apartments for each kind of poultry animals are preferred.

CALENDAR OF GARDENING.

So uncertain is the weather at this season, that it is impossible to do more than suggest. At all events, those who desire to have lettuces, radishes, and salads early must be possessed of frames and lights. We do not allude to forcing, but simply to protection; yet this will imply some kind of linings, either of dung, fern, or straw laid so thick around the box and lights, or brick-pits, as to exclude a frost of 20 degrees, which often visits us and lasts many days. Every vegetable grown under frames must have air in fine intervals by day, the sashes closed every night, and be covered, whenever it

freezes, with straw-mats, the most effective means of defence that can be used.

If the weather and ground be open, the green and white cos-lettuce and the brown Dutch, and also a sprinkling of short-topped radish, can be sown on a warm border; the earth ought to be free, open, and rich, to promote quick growth, and straw or fern should be at hand, to throw over on hard nights. Sow radishes twice,

A little horn carrot seed, a drill of round spinach, some mustard and cress, may be sown, but little good will result in general.

Peas and broad beans are sown at least $2\frac{1}{2}$ or 3 inches deep, in soil enriched in the autumn.

Earth-up peas and beans, if any be ready, observing to select the driest weather. Transplant cabbage from the seed-bed.

In frosts, protect the cauliflowers under glasses, celery by a couple of boards laid ridgewise, or by straw on each side of the ridges; wheel out manure, to be ready for plots, asparagus beds, &c.

FRUIT GARDEN.

Prune very little, unless the buds swell materially; lay manure around the roots of gooseberries,

currants, and raspberries—it very much improves the spring growth. Do the same also to fruit-trees and espaliers.

FLOWER GARDEN.

If snow abounds, recollect to have it whisked or pulled off all the evergreens before the sun breaks out; nothing better prevents scalding and other accidents to the foliage. Do nothing in the way of planting flowers, but sow seeds in pans, marking each, and place them in a frame. Much time and labour are economised, and flowers better secured by this method of proceeding.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR DECEMBER.

The continuance of remarkably fine and open weather has been productive of great advantage to agriculture. In all our leading counties, ploughing and sowing have progressed steadily, and quite as much land has been sown with wheat as in the ordinary run of years; whilst, with very few exceptions, the accounts in reference to the appearance of the wheat plants are decidedly favourable. Notwithstanding that prices are still very low, large quantities of wheat have been thrashed out and disposed of; nevertheless, the trade has been in a most unsatisfactory state, and the quotations have had a drooping tendency. The rise in the value of money in the early part of the month had some effect upon the demand for foreign wheat, which sold with difficulty, at 1s. per qr. less money; but the present comparative ease in the discount market—although capital is still worth 7 per cent.—is calculated to prevent forced sales, and give a better tone to the trade. We may here observe that the Indian corn crop in America has, this year, turned out very deficient. One account states that the yield in the Federal States is 130,000,000 bushels less than is required for consumption. If these figures should prove correct, a considerable advance must take place in the value of wheat and flour in America, because there will, no doubt, be an increased demand for those articles. Already, fine flour is much dearer at New York than in England; but a further improvement in the inquiry is calculated to check shipments. We do not anticipate, however, very great excitement in the trade here, arising from a falling off in the imports of produce from America, because, from the great abundance of wheat in France, Germany, and Russia, we may safely conclude that a very moderate rise in prices would be speedily followed by a large influx of grain and flour from the Continent. Full average supplies of both English and Scotch barley have been on offer, and, for the most part, sales have progressed slowly, on lower terms. All other kinds of spring corn have ruled heavy and in favour of buyers. The stocks of foreign grain and flour in warehouse in the United Kingdom are now smaller than at the corresponding period during the last two years, and we understand that the quantities on passage are somewhat limited. Everything, therefore, favours the impression that wheat has seen its lowest range.

Immense supplies of potatoes have been on sale in the various markets, in full average condition. All kinds have moved off heavily, at low currencies—viz., from 45s. to 90s. per ton. In December, 1862, the best samples were worth 180s. per ton. The imports from the Continent have been brisk, and we understand that they will continue so, unless prices should advance in London. In all quarters, very large supplies of potatoes are on hand, and most accounts agree in stating that the crop is keeping remarkably well.

The high range in the price of money has produced some business in the wool trade. No quotable change has taken place in prices; but manufacturers, generally, have purchased cautiously. At the last public sales held in London about 12,000 bales of colonial wool were disposed of, for shipment to the Continent; but the foreign inquiry for English qualities

has fallen off considerably. However, the bulk of the last clip has passed into the hands of our own manufacturers, who continue to hold very light stocks for the time of year.

The demand for both English and foreign hops has been somewhat active, at an advance in the quotations of from 5s. to 10s. per cwt. The supplies have fallen off, and the arrivals from abroad have exhibited a deficiency. Some of the Bavarian hops have come to hand in excellent condition, and realized as much as 160s. per cwt.

Advices from Scotland represent the grain trade, almost generally, as in a very inactive state. Wheat has ruled lower in price, and nearly all other articles have been somewhat depressed in value. The barley crop has turned out very productive; but the quality of the samples is not equal to 1862.

In Ireland, Indian corn has been disposed of in rather large quantities, chiefly for feeding purposes; but all other kinds of produce have moved off slowly, and the currencies have not been supported. The shipments of produce to England have been on a very moderate scale.

No change of importance has taken place in the value of either hay or straw, and the demand for those articles has been much restricted. Meadow hay has sold at from £3 to £4 10s., clover £4 to £5 10s., and straw £1 6s. to £1 10s. per load.

The cattle markets have been heavily supplied with stock for Christmas consumption, and a large business has been transacted in them, at steady currencies. The great prosperity in our manufacturing districts, save in the article of cotton only, has greatly increased the demand for food, and although we may continue to import largely from the Continent, and although production may improve, it is evident that high quotations will prevail during the whole of 1864.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Although the various markets have been somewhat heavily supplied with beasts, in remarkably good condition, more than an average business has been transacted in prime stock, at, on the whole, a moderate range in the quotations. On the "Great Day" in London upwards of 10,000 beasts were exhibited. This is by far the largest number on record, and yet, such is the amount of consumption going on, really prime Scots and Crosses realized 5s. 2d. per 8lbs. Sheep have come forward somewhat freely, and in good condition; nevertheless, the enquiry for them has continued tolerably active, at full currencies, the best Downs having sold at quite 6s. per 8lb. The veal trade has ruled steady for the time of year; but pork, owing to its great abundance, has met a dull inquiry.

Advices from most of our grazing districts, as well as from Scotland, state that both beasts and sheep have fattened somewhat rapidly, and that the health of the stock, generally, has continued good. Large supplies are expected to reach the metropolis from Norfolk, Suffolk, Essex, and Cambridgeshire, during the season now just commenced. Our impression is, however, that high rates will prevail during the whole of 1864,

even though we may be in a position to import increased supplies of stock from the continent. During the month, the arrivals into London from Holland and other quarters were as follows:—

		HEAD.	
Beasts .. .. .	.. .. .	7,165	
Sheep .. .. .	.. .. .	24,546	
Calves .. .. .	.. .. .	2,033	
Pigs .. .. .	.. .. .	691	
Total		44,435	
Same time in 1862 .. .. .	.. .. .	25,754	
" 1861 .. .. .	.. .. .	21,904	
" 1860 .. .. .	.. .. .	20,795	
" 1859 .. .. .	.. .. .	17,430	
" 1858 .. .. .	.. .. .	19,099	
" 1857 .. .. .	.. .. .	6,608	
" 1856 .. .. .	.. .. .	11,079	
" 1855 .. .. .	.. .. .	19,505	
" 1854 .. .. .	.. .. .	18,349	
" 1853 .. .. .	.. .. .	21,918	
" 1852 .. .. .	.. .. .	11,870	

About 300 Spanish beasts have come to hand in good condition, but they have sold somewhat heavily.

The total supplies of stock exhibited in the Great Metropolitan Cattle Market have been:—

		HEAD.	
Beasts .. .. .	.. .. .	29,302	
Cows .. .. .	.. .. .	485	
Sheep .. .. .	.. .. .	88,470	
Calves .. .. .	.. .. .	1,150	
Pigs .. .. .	.. .. .	2,680	

COMPARISON OF SUPPLIES.					
Dec.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1862.....	25,810	536	85,621	1,354	3,082
1861.....	24,840	470	84,630	701	2,950
1860.....	24,540	510	82,340	1,577	2,445
1859.....	24,484	470	78,980	1,171	2,187
1858.....	20,523	490	74,275	1,472	2,450
1857.....	19,830	375	67,132	1,209	1,915
1856.....	23,995	475	73,200	1,526	2,880
1855.....	22,412	590	90,030	1,376	3,184
1854.....	20,219	120	88,880	1,573	2,746

The receipts of native stock thus compare with December, 1861 and 1862:—

	1863.	1862.	1861.
From Lincolnshire, Leicestershire, and Northamptonshire	10,500	13,800	14,000
Norfolk	2,300	2,350	1,500
Other parts of England....	3,800	2,000	4,240
Scotland	2,370	1,805	1,330
Ireland	2,350	2,420	2,300

Beef has sold at from 3s. 4d. to 5s. 2d., mutton 4s. to 6s., veal 4s. to 5s., and pork 8s. 6d. to 4s. 6d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.					
		Dec., 1859.		Dec., 1860.	
		s. d.	s. d.	s. d.	s. d.
Beef..... from	3 2 to 5 4.....	3 0	5 6	3 4	6 0
Mutton	3 4 to 5 4.....	3 4	6 0	3 4	6 0
Veal	3 8 to 4 10.....	3 10	5 4	3 10	5 4
Pork	3 6 to 5 0.....	4 0	5 4	4 0	5 4
		Dec., 1861.		Dec., 1862.	
		s. d.	s. d.	s. d.	s. d.
Beef..... from	3 2 to 5 2.....	3 4	5 2	3 4	5 2
Mutton	3 4 to 5 8.....	3 6	5 10	3 6	5 10
Veal	4 6 to 5 6.....	3 6	5 6	3 6	5 6
Pork	3 8 to 4 10.....	3 4	4 8	3 4	4 8

Some remarkably fine cross-bred sheep have arrived from Holland, and realise high quotations. In the general quality of the foreign beasts at hand, very little improvement has taken place.

Newgate and Leadenhall marke's have been heavily supplied with all kinds of meat; yet, an immense business has been transacted at about stationary prices. Beef may be quoted at from 2s. 10d. to 4s. 6d., mutton 3s. 4d. to 4s. 8d., veal 4s. to 4s. 8d., and pork 3s. 4d. to 4s. 8d. per 8lbs. by the carcase.

CARMARTHEN BUTTER EXCHANGE, (Saturday last).—A very small market, and the supply of Butter not adequate to the demand, prices ranging from 10½d. to 11½d., according to condition and quality. In the absence of frost and snow, we anticipate no variation in value. The weather at present like May.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The month of December witnessed extraordinary atmospheric changes. The first week was stormy beyond the memory of many—the disasters at sea being frightful, and on the land very extensive, with a heavy downfall of rain; but, immediately afterwards, there was a sudden transition to clear and calm weather, with occasional interruptions, and the closing fortnight was quite above the average of season, both as to clearness and temperature. Field interruptions, therefore, have not been serious just at the close of the year, and the young Wheat everywhere looked well, according to the time of planting. Cattle have had a fair bite of grass, and no reculents have been damaged by frost. The Cattle Show gave full proof of agricultural energy and success, which has secured an increasing amount of public interest. The last Monday in November, which could not be included in our review of that month, happened to be the only lively one, prices then being generally 1s. per qr. higher for English Wheat, and 1s. to 2s. for foreign; and it is under the influence of the markets then held, that the general averages have since continued to show a slight advance. Every thing at that time looked fair for a further improvement, the attention of capitalists being drawn to the low ranges of prices, but the exigencies of foreign

Governments brought a sudden rise in the rate of discount, which completely changed the face of things, and though less pressure has since been felt, the corn market has not recovered from the shock, the greatest depreciation being felt on the second Monday, when prices fell 2s. per qr., leaving much heaviness entailed on subsequent markets from the holidays and general indisposition of buyers to contract fresh bargains at the close of the year. There have, however, arisen serious complications on the Schleswig-Holstein question, and with armies already set in motion and human passions excited, one fatal spark lighting upon materials so combustible may kindle up an European war: with that probability before us there is an equal prospect of a rise in Wheat; for, with all our abundance, the cutting off either of Baltic or American supplies, wholly or in part, will be a hint to farmers not to throw their opportunities away. A rise of 10s. per qr. might then ensue without the slightest pressure on the public. The Baltic ports have been already apprehensive of a Swedish and Danish blockade, and though this would make little difference to places ordinarily blocked up by ice, they would feel it severely through the spring and summer. Nor is the Polish difficulty to be lost sight of, which, taking

also a wider range, might cut off or diminish supplies from Russia. So two chief sources of supply are in danger of failing. Beyond the European difficulties there is apprehension as to the power of America to go on at the rate she has in shipments, Montreal speaks of a deficit in receipts this season of no less than three millions of bushels of wheat, and so dissatisfied have the Northern States been with current rates, that their own entanglement in war and monetary pressure has not prevented extensive speculation, showing that whatever opinion England may have of the future, America is confident of higher rates. Indeed, either in the event of a speedy peace with the South, or of a continued war, the opinion seems justified. War must lessen labour and increase waste. Peace must make an enormous demand for the necessities of the Southerners, who for a time would be the best customers of the Federal States. On the other hand, if we take it for granted that peace is everywhere to rule, are our prices, so much below the average of seasons, likely to be kept down at the present range when stocks every month must be reducing and falling into wealthier hands? But little differences of value have obtained abroad, though prices in the principal shipping ports, as well as in France, have been somewhat declining, as the quotations hereunder will show. Fine wheat in Paris has been selling at about 42s. per qr., lower sorts at 39s. Prices at Antwerp for old Baltic were 44s. 6d., winter American 43s., Gbirka 40s. per qr. Wheat at Maastricht in Holland was quoted 41s. per qr. Saale wheat at Hambro' 42s. per qr.; fine new at Danzig, 42s. to 44s.; old, being very scarce, 47s. per qr.; new native at Cologne 39s. At Straubing, top quality, 40s. At Odessa the range of prices was 27s. to 36s. 6d. At Venice the best wheat was quoted 46s.; the best soft at Algiers 45s. 6d. per qr. In Montreal, Upper Canada, spring wheat was worth 31s. 7d. per qr. Chicago, at New York, 30s. 6d. per qr. of 480lbs.; winter, 33s. 4d.; white Michigan, 38s. per qr.

The first Monday in London began on moderate arrivals of English wheat, and a small supply of foreign. But few samples were exhibited from Kent and Essex during the morning, and the condition was inferior. Fine dry qualities only sold slowly at the previous rates, those in bad order being neglected. A sudden rise in discount having checked speculation, there was very little doing in foreign beyond a retail demand, and had sales been forced lower quotations must have been accepted, more especially for new. Floating cargoes went off slowly at the previous currency. The dull reports from London and the state of the money market appeared generally to influence trade in the country. Many places noted a decline of fully 1s. per qr.: among them were Boston, Bury St. Edmund's, Gainsborough, Market Rasen, Stockton-on-Tees, and Bristol. Some were down 1s. to 2s. per qr., as Spalding, Newark, and Newbury; but Hull, Birmingham, and Gloucester made little difference in prices. Liverpool gave way 2d. per cental on Tuesday, and there was no rally on the following market. In Scotland, Glasgow and Edinburgh reported great heaviness in the trade,

with easier rates for low qualities. Dublin was dull, but the small quantity of wheat on show kept prices as before.

The second Monday commenced with improved English and good foreign supplies. Though the near counties sent up but a moderate show of fresh samples, these, with those over-left during the previous week, made a fair exhibition on the English stands. The bulk being but in poor condition, there was quite an anxiety to sell, on the part of factors, who would gladly have made a clearance at 2s. per qr. below the previous terms, after a few picked lots were taken at about 1s. per qr. less money; but the trade was averse to business, and the bulk remained on hand. Transactions in foreign were very limited, with prices somewhat in favour of buyers. Arrivals off the coast being small, prices were unchanged. The country markets were again partly influenced by the London decline, and general reports of dulness were received, but some among them withstood all attempts to force down prices. Among these were Ipswich, Bury St. Edmunds, Rochester, St. Ives, and Gloucester. Others were only 1s. per qr. lower, as Leeds, Louth, Lynn, Boston, Gainsborough, and Wolverhampton; but Hull, Stockton, and Spalding were 1s. to 2s. per qr. cheaper. Liverpool noted a decline of 2d. per cental on Tuesday, and was dull again on Friday, without quotable change. Edinburgh and Glasgow quoted 1s. per qr. less money, and Dublin about the same reduction.

The supplies for the third Monday were about the same as on the previous week, both in English and foreign qualities. The weather previously being fine, the moderate show of English qualities was improved in condition, both on the Kentish and Essex stands; but with Christmas immediately in prospect, and money matters only slightly improved, there was very little disposition on the part of millers to buy. The few samples sold were placed at the former rates, but to have cleared the bulk less money must have been accepted. The foreign trade was almost as slack, but holders were not anxious to press sales, with the doubtful aspect of European politics. Cargoes afloat being but few in number, were unaltered in value. The Christmas holidays occurring this week, the country markets partook of a holiday character. Some were 1s. per qr. lower, others only reported business in suspense. Liverpool was cheaper 2d. per cental; Glasgow and Edinburgh, as well as Dublin, being almost without trade.

The fourth Monday began on the smallest English and largest foreign supply of the month. The Essex and Kentish stands were very scantily provided with fresh samples during the morning, and though the condition was fair the same indisposition to business was evinced by millers, so that for want of trade prices were nominally the same. There was, however, some little doing in foreign at former rates, especially for fine old qualities, while new were quite unsought. Cargoes afloat were held at previous quotations.

The imports into London for the four weeks were 31,309 qrs. English, 71,088 qrs. foreign, against 23,447 qrs. English, 111,450 qrs. foreign for the same period in 1862. The imports into the

Kingdom for November were 442,330 qrs. wheat, 464,354 cwts. flour.

The flour trade has been dull all through the month. Country as well as foreign sacks have cheapened about 1s. per sack, but the sudden falling off in the receipts from America have made holders of this quality firm, and the great scarcity of really fine barrels has somewhat enhanced their value. Town prices have continued unaltered, 40s. still being the top price. The London imports for the month were 49,415 sacks of country make, with 5,130 sacks 12,956 brls. foreign, against 67,661 sacks country, 3,434 sacks 34,914 brls. for the same period in 1862.

The barley trade has been exceedingly heavy all through the month, and much loss has ensued from foreign imports, which, happily for importers, were not on a very large scale. On English malting qualities there has been a decline of about 1s. per qr., and on secondary and low grinding the reduction has been 1s. to 2s. per qr., inasmuch that the latter can now be had at 23s. per qr., weighed 50 lbs. to the bushel, and heavy 5½ lbs.; middling foreign have been sold at 26s. 6d. The failure, however, of the imports of maize, from the deficiency of the crop in America, or the consequence of an early frost, may bring about some reaction in prices. The imports into London for the four weeks were 17,736 qrs. British, 68,704 qrs. foreign, against 21,565 qrs. British 41,812 qrs. foreign in 1862.

Oats also, with a very moderate foreign importation, have further receded in value about 1s. per qr., excepting choice old Russian, which are getting scarce, the best of which still bring about 21s. per qr. We cannot help thinking that this grain, notwithstanding the goodness of the English crop, has about seen its lowest, and in case of the outbreak of war between Germany and Denmark, prices must improve. The imports into London for the month were in English sorts 25,137 qrs., Scotch 4,045 qrs., Irish 7,874 qrs., and foreign 58,362 qrs., against 22,610 qrs. English, 1,023 qrs. Scotch, 3,274 qrs. Irish, and 131,355 qrs. foreign for the same period in 1862.

Beans have been a quiet trade, but experience no diminution of value, though supplies have been fair, both English and foreign, and the weather has been mild. In Egypt, they have lately been rising in value, and the knowledge of this fact may have had something to do with the firmness of holders, and as prices at Alexandria are about 26s. 6d. per qr., and here only 31s. to 32s., there is no profitable margin for imports. The receipts into London during the month were in English sorts, mostly new, 5,374 qrs., in foreign 10,174 qrs., against 4,385 qrs. English, and 14,128 qrs. foreign in 1862.

Peas have been decidedly in buyers' favour, more especially the new clay-coloured and grey, say, to the extent of fully 2s. per qr., the present value not being over 31s. per qr. Maples not being so plentiful, have not been equally depressed; but white have scarcely been enquired for, and must be only held as nominally worth about 38s. for good boilers. Should the weather, however, take up sharp, or any large naval contracts come

out, they would speedily improve in value. The imports into London for four weeks were 3,619 qrs. English, and 10,429 qrs. foreign, against 2,989 qrs. English, and 3,491 qrs. foreign for the same period in 1862.

There have been fair imports of Linseed, with fluctuations of value during the month, leaving prices much as they commenced. During a week of large exports prices were raised 2s. per qr.; but on the following week this was lost, as heavy imports from India were known to be on the way, that country having been favoured with a good crop this year. Cakes have been in fair request at equal prices all through the month, to get up the cattle well for Christmas.

The seed trade has been almost suspended, the only article of interest having been Canaryseed, which has further increased in value, more especially for fine qualities, which have become very scarce. New foreign spring Tares have been offering very low—say, at 31s. per qr., without as yet meeting much attention, though buyers can hardly expect to do so well in spring. New English red Cloverseed has from time to time appeared, but holders were too high in their notions to bring on business.

PRICES OF SEEDS.

BRITISH SEEDS.

MUSTARD, per bush., white	9s. 6d. to 10s.
CORIANDER, per cwt.....	14s. 1s.
CHAMX, per qr.....	5s. 6s.
TARES, winter, new, per bushel.....	5s. 5s. 6d.
TRIFOLIUM.....	24s. 27s.
LINSEED, per qr., sowing—a. to 70s. crushing	56s. 6s.
LINSEED CAKES, per ton.....	£9 10s. to £10 10s.
RAPSEED, per qr.....	6s. to 6s.
RAPSEED CAKES, per ton.....	£5 10s. to £6 0s.

HOP MARKET.

BOROUGH, MONDAY, Dec. 28.—We have a very firm market for every description; but, as usual at this season of the year, there is not much business doing.

Mid and East Kents.....	112s., 135s., 160s.
West of Kents.....	95s., 115s., 126s.
Sussex	90s., 105s., 115s.
Bavarians	105s., 126s., 160s.
Belgians.....	72s., 76s., 80s.
Americans.....	105s., 112s., 120s.

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

Yorkshire Regents	75s. to 85s. per ton.
Ditto Flukes	90s. to 100s. "
Ditto Rocks	60s. to 70s. "
Perth, Farfar, and Fifeshire Regents	60s. to 70s. "
Ditto Rocks	50s. to 60s. "
Kent and Essex Regents ..	70s. to 80s. "

ENGLISH BUTTER MARKET.

LONDON, MONDAY, Dec. 28.—We note a very strong trade, and prices are not supported.

Dorset, fine	None.
" middling	90s. to 98s. per cwt.
Devon.....	None.
Fresh	12s. to 16s. per cwt. lbs.

CURRENT PRICES OF ENGLISH WOOL.—Per lb.

Shropshire—Down tegs	1s. 6d. to 2s. 1d.
" " ewes.....	1 11
" " lams	1 4
Southdown tegs.....	1 2½
Leicestershire—Ewes and wethers.....	1 5
" " Lams	1 2½
Somersetshire—Ewe and wether.....	1 11
Hertfordshire—Ewe and wether.....	1 2½

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L. J. Goussier

White & Coloured

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J. Goussier



A. H. H. H.

Illustration of a bull, showing the head, horns, and body, with the artist's signature 'A. H. H. H.' in the bottom right corner.

PLATE III.

WELSH GALLOWSAYS.

THE PROPERTY OF THE REVEREND W. HOLT BEEVER, OF PENCRAIG COURT, ROSS,
HEREFORDSHIRE.

The following "notes" with which we have been favoured by Mr. Beever are far too good for us to interfere with:—

"Of the old white mare there is nothing to record further than that being short-jointed, a clever trotter, and a massive specimen of the large pony sort—as distinguished from the cob, which is rather a compressed horse than a pony—used in the mines about Swansea, she is well adapted wherewith to try the cross of a blood-horse, with a view to breeding either a bright-moving park hack, or a clever fifteen-two hunter of rarest endurance and surefootedness.

"I have found that there is a good deal of uncertainty in the *size* of the produce resulting from this cross. The colts seem to alternate in size. One year a cob is born, the next year a full-sized fifteen-two, and the next again a cob. This old mare, of which I write, is the dam, by a most commonplace small roadster sire, of the dappled grey pony that won a prize of the Royal Agricultural Society at Canterbury, where she was petted by fair hands, and fed with queen-cakes to such a degree that her career was nearly cut short, on her return home, through an apoplectic seizure. A yearling by *Revenge* out of the old mare is a perfect gem as yet, and just what I aimed at as a breeder, having a faultless head, and excellent proportions for a low and lengthy blood-hack of fashion and substance; coming up to be fed already with exactly that admirable grandeur of gait that distinguished the broad-chested Sledmere mares as they moved astonished round the ring of sale.

"I have the old mare and four grey daughters, all of which will ultimately be bred from if the cross nicks.

"Being apparently half asleep as she was drawn, she does her position drill instructor great discredit, as in nature she stands quite square, having

no tendency whatever to such cow-hock appearance. I don't think the *print* does the *painting* justice as regards her and her foal. They are too hard and flat.

"Her companion, the brown mare, is of quite another stamp. She is herself a specimen of the first cross between a blood-horse and a stout pony. She had the disadvantage of being got by *Gaper*, a sire whose disposition her astonishing powers of lasting belie. She is a clever trotter and a good jumper, and might have made a galloway steeple-chaser; but it was by her marvellous speed that she won the name of provincial celebrity that she has, being a sort of South Wales Blink Bonny. Her name, 'Polly Brown,' was, a few years since, a household word with every man, woman, and child throughout the country. There was not a frieze-coated farmer in Gower, nor a miner in the whole district, who did not or would not stake more than he ought upon her chance of winning whenever she ran; and to this day the old Swansea fish-women will arrest the suction of their short black pipes at the very mention of her name, to recount their recollections of her prowess.

"She ran in numberless races, as well as in matches against time, and is said to have been only twice beaten—once when she was not wanted, and again, when caught up from grass by her impetuous Celtic owner, she was started against full-sized platers on a course where Mr. Parr once rode, and Clothworker ran. Notwithstanding her disadvantage, nothing could catch her for full three-quarters of a mile, and she finished a good third. In galloping she seems to bound as it were off India-rubber, and the rapidity of her strokes just realizes one's conception of what the knowing mean when they talk of 'greased lightning' and 'kicking flashes.'

"Fond of her as I am, I don't think I could

exaggerate her excellence as a hack and racing pony. I am only sorry that I could not send you more definite information respecting the matches she has just run. I should have had, however, to traverse a long distance, and I have been too much tied down to do it. I find that here (in Berkshire) the tit-bits that the leading farmers ride, and pride themselves upon, have generally been brought out of a Welsh drove. I would that some one could work up these precious elements, as Suffolk has done her cart-horses. But Mr. Talbot will, I expect, do much with Revenge."

A portrait of this horse, Revenge, appeared in our Magazine for May, while Mr. Beever himself introduced the little nag into South Wales, as he also has some Suffolk horses and Shorthorn cattle, all of the best of their kind. His taste for a rural life has also developed itself in other ways, as he is the

author of the Royal Agricultural Society's prize essay on "The Time of Entry on Farms," as well as of a work, published by Chapman and Hall, modestly entitled "*Notes on Fields and Cattle*," but one of the most genuine and delightful country books that has been seen for many a long day. After being in residence there for some years, Mr. Beever left Cowbridge a few weeks since, the occasion of his departure being seized upon as the opportunity by his many friends for presenting him with a handsome testimonial of the respect in which he was held in the district. Mr. Beever, however, has not gone far away from them, having purchased a property on the banks of the winding Wye, and where no doubt he will work up something more from so good a foundation as the Welsh pony.

PLATE IV.

A SUSSEX STEER.

THE PROPERTY OF MR. JOHN SHOOSMITH, OF BERWICK, LEWES.

"Last year we had but eleven Sussex cattle, but that useful breed now numbers thirty entries, and Mr. Shoosmith's first prize steer is just the sort for the meat market. . . . The Sussex evince still further advancement in that style and quality so observable on the last few occasions."

It was thus we wrote in our last number on the Smithfield Club Show, and here is the Sussex Prize Steer. He was bred by Mr. Shoosmith, being by Nimrod, out of Golden, by Selmes; and two years and ten months old when exhibited at Islington. Both the sire and dam were also bred at Berwick, and the latter herself took two premiums at local shows, while two of her produce have been winners in London—one in 1861 and the other in 1863. Even further, Golden made her 14lbs. of butter a week—pretty well for a Sussex, which as a breed are not generally considered good milkers. However, Mr. Shoosmith thinks they have only to be better known to be more appre-

ciated, as "they have the quality of the Devon with more size, and are taken by the butchers to be, next to the Scots, the best fleshed animals they kill."

This steer was shown in the week previous to his coming to town at the Brighton Fat Stock Show, where he took the second prize, and Mr. W. Wood's beast the first, their places being reversed by the Smithfield Club authorities, as, in fact, were nearly all the Sussex awards. Mr. Shoosmith has only a small herd, but since he has figured as an exhibitor no one has been more successful. Dating from the establishment of the Sussex Class in London, he has shown six animals and taken four prizes, three firsts and a second; while in 1861 he won in all ten first prizes, amounting to £135 in very hard cash.

We are only sorry to add that the Berwick stock is not yet registered in the *Sussex Herd Book*, a palpable mistake that cannot be too soon corrected.

POULTRY-YARD SWEEPINGS.

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

Some recently-reported researches of Professor Anderson, on the dung of our domestic birds, are of considerable value. They are also suggestive of several other and even more practical enquiries. These fertilizers have, from a very early period, attracted the cultivator's attention: that of the pigeon was employed in eastern countries 900 years B. C. (2 *Kings* vi. 25). The earliest of the Latin agricultural authors commended its use for meadows, corn lands, and gardens (*M. P. Calo*, *Nb.* 86); and it is now two centuries since John Worlidge

maintained that one load of hen's or pigeon's dung was worth ten loads of other manure (*Mysterie of Agriculture*, 71). The difficulty of procuring these dressings in any considerable quantity naturally retarded their use; but when the importation of the guano of Peru into this country began to be so large, then other sources of a supply of the dung of birds were first considered; and hence, in 1847, some of the dung of the pigeon began to be imported from Egypt. As collected from the extensive dove-cotes in the very dry cli-

mate of the valley of the Nile, it was analyzed by the late Professor Johnston (*Trans. High. Soc.*, 1847, p. 580). He found it to contain 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
Siliceous matter	21.43
100.	

The fresh dung of our pigeon-houses is far, however, from being as rich as the Egyptian specimen examined by Professor Johnston; for in the analysis of some pigeon-dung carefully collected by Mr. Gibson, of Woolmet, from his own dovecote, in as fresh a state, and as free from foreign matter, as it was possible to obtain it, Professor Anderson found, per cent. (*Trans. High. Soc.*, 1864, p. 170)—

Water	58.32
Organic matter	28.25
Phosphates	2.69
Sulphate of lime	1.75
Alkaline salts	1.99
Sand	7.
100	
Ammonia	1.75

The difference in the composition of these specimens Dr. Anderson attributes to the circumstances under which the dung is accumulated. In our cold and damp climate it retains its moisture for a considerable time, fermentation takes place, ammonia is evolved and lost, while in the warm and dry atmosphere of Egypt it is rapidly dried up before decomposition has commenced, and thus the organic matter is retained more nearly in the state in which it is deposited by the birds.

The analysis of hen's dung, by the same Professor, seems to indicate its rather inferior value to that of the pigeon as a fertilizer. He found, in a specimen carefully collected by Mr. Gibson, per cent. (*ibid.*, p. 172)—

Water	60.88
Organic matter and ammoniacal salts ...	19.22
Phosphates	4.47
Carbonate of lime	7.65
Alkaline salts	1.09
Sand	6.69
100.	
Ammonia	0.74

Several comparative experiments, made some time since by Mr. A. J. Main, of Whitehill, in East Lothian, are in accordance with the examinations of the chemist. He employed both pigeon's and hen's dung, in conjunction with farm-yard manure, as a dressing for carrots, with a result per acre of which the following is a tabular statement (*ibid.*, 1849, p. 503)—

Manure employed.	Carrots produced.
	Tons cwt.
Home-made manure, 24 tons	12 13½
Home manure 16 tons, pigeon's dung 4 cwt. .	14 5½
Ditto 16 tons, hen dung 4 cwt.	11 12½
Ditto 16 tons, Peruvian guano 4 cwt. ...	13 16½

From other trials of Mr. Main, with hen's dung, for turnips, in a dry season, it is evident that a fair supply of rain is always needed for the display of the very considerable power of this kind of manure.

The dung of the goose and that of the duck was also examined by Professor Anderson. He found these to contain per cent. as follows, which, for the more easy

comparison, I will give in a tabular form in juxtaposition with that of the pigeon and the hen:—

	Dung of the			
	Pigeon.	Hen.	Duck.	Goose.
Water	58.32	60.88	46.65	77.08
Organic matter and ammoniacal salts	28.25	19.22	36.12	13.44
Phosphates	2.69	4.47	3.15	0.89
Carbonate of lime . . .	—	7.65	3.01	—
Sulphate of lime	1.75	—	—	—
Alkaline salts	1.99	1.09	0.82	2.94
Sand	7.	6.69	10.75	5.68
100. 100. 100. 100.				
Ammonia	1.75	0.74	0.85	0.67

These valuable examinations, we must remember, were made of the dung of birds living chiefly on vegetable food. What would be the result upon the composition of their dung by feeding them upon a considerable proportion of animal food we can only judge from analogy. Thus, if we examine the excreta of those birds which feed chiefly on fish, we find that it abounds with uric acid and ammonia. From these analyses we may also understand why the Peruvian farmers so much prefer the recent guano evacuated by the sea birds to that of the older, more decomposed deposits. Dr. Wollaston found that the recently-voided excreta of the gannet, when dry, contained hardly anything but uric acid; and Coindet found in 100 parts of the solid excrement of the sea eagle—

Ammonia	9.22
Uric acid	84.65
Phosphate of lime	6.13

100:

Now, there is no doubt that these two last-examined varieties must be classed with the most powerful of organic manures; and it would hence seem very desirable to ascertain the chemical effect produced upon the excreta of our poultry, by feeding them with a considerable portion of animal food. What, for instance, is the composition of the hen dung collected in such large quantities in those great poultry establishments near Paris?

There surely might be in some districts of our island profitable results obtained from a careful study of the system so well arranged in these great Parisian yards. One of these has been described in recent numbers of *The Scottish Farmer*, and also in *The Journal of Horticulture* (vol. xxix., p. 83), which I cannot, perhaps, do better than abridge, as a conclusion to this paper. The reporter truly enough tells his readers, that with care and good management, no branch of domestic industry is more profitable than rearing poultry. But then we must carefully attend to the precautions essential to ensure success. Thus, many persons have supposed that what is profitable on a small scale might be made still more so when merely carried on to a larger extent; but repeated experiments in this and other countries have proved this to be a mistake. The secret of the matter is, that hens cannot thrive and lay without a considerable quantity of animal food. Where but a limited number of fowls are kept about the farm-yard, the natural supply of insects is sufficient to meet this demand; but when attempts have been made to extend the business beyond the source of supply, they have not prospered. It will be seen from the following interesting account, that M. de Sora, in France, has adopted a method that has proved completely successful, by affording an artificial supply of this essential portion of their food.

The French practical philosophers certainly know how to make the most of things. Thus M. de Sora has the power of making hens lay every day in the year by

feeding them on horseflesh. The fact that hens do not lay eggs in winter as well as in summer is well known, and the simple reason appears to be that they do not get the supply of meat which they obtain in the warm season from worms and insects. M. de Sora was aware of these facts, and living at the time upon a dilapidated estate a few miles from Paris, the land having been bequeathed to him a few years previously, he set himself earnestly to the task of constructing a henary which should be productive twelve months in the year. He soon ascertained that a certain quantity of raw mince-meat, given regularly with other food, produced the desired result; and commencing with only some 300 fowls, he found that they averaged the first year some twenty-five dozen eggs in the 365 days. The past season he has wintered, thus far, about 100,000 hens, and a fair proportion of male birds, with a close approximation to the same results. During the spring, summer, and autumn, they have the range of the estate, but always under surveillance. In winter their apartments are kept at an agreeable temperature; and although they have mince-meat rations the year round, yet the quantity is much increased during the cold weather. They have free access to pure water, gravel, and sand, and their combs are always red. To supply this great consumption of meat, M. de Sora has availed himself of the superannuated and damaged horses which can always be gathered from the stables of Paris and the suburbs. The horses are taken to an *abattoir* owned by M. de Sora, and there neatly and scientifically slaughtered. The blood is saved clean and unmixed with offal. This is sold for the purposes of the arts, at a remunerative price. The skin goes to the tanner, the head, hoofs, shanks, &c., to the glue-maker and Prussian-blue manufacturer; the large bones make a cheap substitute for ivory with the button-maker, while the remainder of the osseous structure is manufactured into ivory black, or used in the shape of bone-dust for agricultural purposes. Even the marrow is preserved; and much of the now fashionable and highly-perfumed lip-salve and pomade was once enclosed in the leg bones of old horses. Uses are also found for the entrails, and, in fact, no portion of the beast is wasted.

The flesh is carefully dissected off the bones, and being cut into suitable proportions, it is run through a series of revolving knives, the apparatus being similar to a sausage machine of immense size, and is delivered in the shape of a homogeneous mass of mince-meat, highly seasoned, into casks, which are immediately headed up, and conveyed per railroad to the egg-plantation of M. de Sora.

The consumption of horses for this purpose by M. de Sora has been at the average rate of twenty-two per day for the last twelve months, and so economical are all his arrangements, that he is enabled to make a profit on the cost of the animals by the sale of the extraneous substances enumerated above—thus furnishing to himself the mince-meat for much less than nothing, delivered at his henary. It has been ascertained that a slight addition of salt and ground pepper to the mass is beneficial to the fowls; yet M. de Sora does not depend upon these conditions alone to prevent putrefaction, but has his storerooms so contrived as to be kept at a temperature just removed from the freezing point through the year, so that the mince-meat never becomes sour or offensive; the fowls eat it with avidity; they are ever in good condition, and they lay an egg almost daily in all

weathers and in all seasons. The sheds, offices, and other buildings are built around a quadrangle, enclosing about twenty acres, the general feeding ground. This latter is subdivided by fences of open paling, so that only a limited number of fowls are allowed to herd together, and these are ranged into different apartments, according to their age, no bird being allowed to exceed the duration of four years of life. At the end of the fourth year they are placed in the fattening-coops for about three weeks, fed entirely on crushed grain, and then sent alive to the city of Paris.

As one item alone in this immense business, it may be mentioned that in the months of September, October, and November last, M. de Sora sent nearly 1,000 dozens of capons to the metropolis. He never allows a hen to sit. The breeding-rooms are warmed by steam, and the heat is kept up with remarkable uniformity to that evolved by the fowl during the process of incubation, which is known to then mark higher on the thermometer than at any other period. A series of shelves, one above the other, form the nests, while blankets are spread over the eggs to exclude any accidental light. The hatched chicks are removed to the nursery every morning, and fresh eggs laid in to supply the place of empty shells. A constant succession of chickens is thus ensured, and, moreover, the feathers are free from vermin. M. de Sora permits the males and females to mingle freely at all seasons, and after a fair trial of all the various breeds, has cleared his establishment of every Shanghai and Cochin-China, breeding only from the old-fashioned barn-yard chanticleers. He contends that the extra size of the body and eggs pertaining to these foreign breeds can only be produced and sustained by extra food, while for capon-raising the flesh is neither so delicate nor juicy as that of the native breed. The manure produced in this French establishment is no small item, and since it forms the very best fertilizer for many descriptions of plants, it is eagerly sought for at very high prices by the market-gardeners in the vicinity. The proprietor estimates the yield of this year at about 100 cords. [A cord of wood in England is equal to 128 cubic feet.] He employs nearly 100 persons in different departments, three-fourths of whom, however, are females. The sale of eggs during the past winter has averaged about 40,000 dozen per week, at the rate of six dozen for four francs.

These details are well worthy of our serious attention. That the demand for poultry and eggs in this country far exceeds the native supply is evinced by the large amount of poultry and foreign eggs annually supplied to us. In 1862, 235,230,860 eggs were imported. It does indeed seem probable that in certain of our localities, where animal food unfit for human consumption can be procured at a reasonable rate, we might profitably imitate the great establishments of M. de Sora. Has the effect of giving a considerable portion of *suik* in the food of poultry been ascertained? Why not devote the spoilt meat of London, and other populous places, which is now largely condemned as unfit for human food, to a properly-regulated establishment of this kind? Thus would the poultry-yard restore to us, in the shape of wholesome food, what is now so often condemned by the inspector to the fire; and moreover, if once a demand for the poultry-yard arose in this way, the temptation to consign spoilt meat to London would be diminished—the risk now so dangerous to its owner, and the consumer, avoided.

HIGH FARMING;

BUT WHERE'S THE MONEY TO COME FROM?

The members of the Wigton Club met lately for the purpose of hearing a paper read by the president, Sir Robert Bisco, Bart., on "High Farming; but where's the money to come from?" There was an unusually large attendance both of the regular members, and non-members introduced by members.

Sir ROBERT BISCO said: In selecting this subject for discussion at the moment when a great empire is passing through the woes of dismemberment—when its financial difficulties are compelling it to inundate this country at any price with its bountiful harvest of agricultural wealth; at a time, moreover, when this country has just garnered, with great difficulty, its own bountiful grain crop, amidst the rains and floods of a cold and dreary autumn; at a moment when our plump, though damp wheat crop has been selling at 11s. 6d. the Cartilage bushel, or £1 10s. 8d. the quarter—I have been influenced by a desire to extend such knowledge as I possess of the principles of an art which has been rightly esteemed the foundation of agricultural success, and as the most simple and certain means of most profitably increasing the supply of food for man, causing the farmer's capital at the same time to yield a better and more certain profit. If we consider (and as thoughtful men we are bound to do so) the great and many difficulties, as well as responsibilities, which seem multiplying upon us, we shall be led to appreciate more sensibly the importance of the present inquiry; and we shall be struck with the fact—well known, but too little reflected upon—that, in proportion as extremely high prices move the community at large to desire that the capabilities of our native soil should be more fully developed in order to increase its production of food, so do many owners, as well as cultivators of that soil, abate their zeal in pursuit of improvements necessarily admitted, though but partially performed, during the now pressing difficulties of extremely low prices. If this should seem like mere assertion, the evidence afforded by the expenditure in drainage, under the government loan, will, I think, leave no doubt on the point, for in 1852, when wheat was 40s. 9d. the quarter, the expenditure on drainage was £412,269 15s. 6d. It became in 1853, when wheat rose to 53s. 3d., only £384,115 13s. 8d.; and declined still further in 1854, when the price rose to 72s. 5d. per quarter, to £316,220 7s. 4d., or about £100,000 less than in 1852. This fact, in its reference to the particular subject of drainage, is the more to be lamented, because not only must the operation be considered essentially to rank among the obligations of the owner and not the occupier of the land, but because it underlies and is the necessary foundation on which the farmer can alone safely invest his capital, or hope for profit from high farming. In fact, high or liberal farming on wet land is a delusion and a snare—an *ignis fatuus*—an act of insanity. It is so necessary to found the present discussion upon the right understanding of this point, that I must be pardoned for having dwelt upon it. This practical view and treatment of the subject can hardly be reprehended when it is remembered that whereas the average amount of capital employed by occupiers in the cultivation of the soil can scarcely be estimated at £6 per acre, the cost of permanently draining these lands would amount to not less than £5 per acre; so that if the tenants were to apply their capital at once to this fundamental work, they would be left with only £1 per acre to provide for all the other expenditure on their farms. If £6 per acre be the average amount of capital employed by farmers in the prosecution of their trade, then I say that high farming and good profits are impossible; and I further consider that any owner who expects a farmer either to drain or to farm wet land, is placing his tenant in circumstances which can only lead to the ruin of both. Having thus prepared the way for a clearer understanding of our subject, allow me to add that I approach the more minute handling of it with very great diffidence, not that I think its principles doubtful or difficult of application, but because I am aware the term "high farming" has unfortunately

become a byword of derision amongst the great bulk of practical agriculturists. Respectfully I submit this should not be so. I believe this course of action has arisen from a misapplication of the term "high farming." The application of very ample capital to land cultivation must produce high farming; but whether that ample capital shall produce a profit on the outlay depends entirely upon the practical experience and good judgment of the man carrying on the business. Nevertheless it is high farming, though it may not be profitable farming. We may now come to the point, and consider what is high farming in its true sense. High farming I take to mean the act of obtaining from any given land the greatest possible value of production of which it may be capable, by any or whatever means, through the investment of capital in any or whatever form. Now to the proof:

Given a farm of 50 acres of grass land.	
Debit the rent	£100
Debit the rates	10
One herdsman	40

	£150

Produce 25 cattle grazed, equal to £6 per head cost.

View the same farm under higher farming:

Given a farm of 50 acres of grass land.	
Rent	£100
Rates	10
Cattle-man	40
Manure at £3 (or some enrichment)	150

	£300

Produce 50 cattle grazed, equal to £6 per head cost.

In these two examples I have so arranged them as to make the cost per head on the cattle equal in each case; but the result will be found very different. In the first example, all the money paid out has left the farmer's pocket for ever; but in the second example half the expenditure is invested in his lease, or, if you like it better, say in his farm. Now, for example's sake, let me assume that the farmer clears one pound a-head in both cases, after paying expenses. In the first case he will gain a profit of £25 off his 50 acres, leaving his land no richer than he found it. In the second example he will gain a profit of £50 off this same 50 acres, and will leave these acres richer than he found them. In this case he gains 20s. per acre profit, but in the previous case only 10s. per acre. But you will, I hope, observe, he gains much more than is here represented; for, as the first lot of 25 cattle never paid off all the rent, rates, and labour, he will be repaid by the second lot of 25 cattle all his cost in manure also. Practically, the first man has paid £6 per head for the grazing of 25 cattle, whilst the 50 cattle of the second man have only cost him £3 per head for grazing, and he has his land in very superior condition for next year. The plan adopted in the first example represents what is called a good fair farmer. The second would properly be called a high farmer. The first receiving 15 per cent. on his outlay for rent, rates, and labour, would complain that rents were too high, because he might not receive sufficient profit to suit his views, and would most likely think a reduction of rent was the only way left of improving those profits. The high farmer, on the other hand, gaining 82 per cent. on his outlay of the same amount of rent, rate, and labour, would cheerfully pay an increase of rent, which would make profitable farming an impossibility to the other man. Gentlemen, excuse me, but I would deny the truth of any statement embodying an idea that rents on the average are too high. It is not the case that rents generally are assessed at too high a value for the land, but that the man is not equal to the rent; or, in other words, that the average of farmers do not know, and therefore do not carry out cor-

rectly, the true principle of profit-making in their cultivation of the land. This I am convinced is the true explanation of the apparent difficulty. It is a dangerous and too prevalent idea that land gives the rent: it is not the land, but the capital invested in the land, aided by the farmer's judgment, which gives the rent and profit. As well might it be said that the plough or the fork yields the rent. Land can only be viewed as a machine through which the farmer passes his capital, which, worked with judgment, will turn out goods yielding a profit. In selecting grass land to exemplify my meaning, I have only done so because it enabled me to put an example in the simplest form. Arable farms are governed by exactly the same law; but on them any examples would have become much more complex and intricate. Neither do I wish it to be supposed that the outlay and return on the examples given above are intended to represent the exact sums either of expenditure or receipts. My object has been to simplify as much as possible and make my meaning clear, so that the great guiding principles of making profits by high farming might not be clouded or lost sight of, by entering into minute details. In all probability some who hear me may mistake or misapply my remarks: to such I say, stay your judgment and think twice. To some practical and honest meaning men my views may appear visionary and simply ridiculous, because they possibly may be opposed to all their own preconceived practices and ideas; to such I say be slow to condemn; but if there be any point you cannot understand, ask me to explain, and I shall cheerfully do so. All I request is, that the question of high farming may not be discussed and condemned upon mistaken or false premises. High farming is too great and valuable a subject to be lightly condemned. It is the only door now open through which farmers can advance so as to enable them to keep pace with the necessities of the times. To the commercial, manufacturing, and trading communities, the principle I have been advocating is a common and every-day fact. Why should it not be equally so to you? You are but as tradesmen or manufacturers; you sell and buy; you manufacture your goods equally with them, though you select land as your manufactory, because best suited to your rearing and knowledge; yet it is the same to you as his shop is to the retail dealer; his mill and machinery to the manufacturer; his warehouse and counting-house to the merchant; his house and counter to the banker; his tools to the mechanic. Each and every trade presents only a different form of machinery for making an interest or profit from capital possessed by the user. Therefore, impress it indelibly upon your minds, that it is capital only, in one shape or another, which gives the profit; all other things are but as means enabling you to accomplish this necessary result. In concluding the first half of our subject, let me now summarise what has gone before. "High Farming" is best for the nation at large, because it provides a maximum of human food. It is the best for the landlord, because it ensures him the highest and most regularly paid rent for his land. It is the best for the tenant, because it gives him the greatest interest for, and security to, his capital, with the least possible drudgery to himself. "High Farming" practically, but only ultimately, increases rent to the landlord, at the same time that it virtually decreases rent, rates, and labour to the farmer. "High Farming" forces from the land the greatest possible amount of food which its composition may be capable of. This is accomplished by liberally supplying it with the uttermost amount of strength and richness it is capable of assimilating, by means of the various manures, suitable for its composition, and the requirements of the plants grown upon it. Having now explained to the best of my power, and I hope clearly, what is meant by "High Farming," with the principles necessary to bring about that result, I shall proceed to show "where the money is to come from." In answering and explaining this question do not for a moment suppose I am about to show you some hidden hoard of ready-coined shining sovereigns from which you may supply your wants, or that I am about to show you any smooth royal road to wealth. Man was told in the beginning, "In the sweat of thy brow shalt thou eat bread." To this we must all submit, whether we like it or not; but in obeying this universal and salutary law, we nevertheless have it in our power to render it more or less irksome, more or less profitable. To make it less irksome and more

profitable is the object of the remarks I am about to offer. The primary object of all business occupations is to make the largest possible profit from a given capital, be that large or small, in whatever shape or whatever character that capital may present itself. Cumberland farmers profess to think they have no spare capital for improvement by "High Farming." I answer, if it be admitted that a little land farmed well is better than a large area only half cultivated, then there is little weight in this argument. Nothing is so grateful or liberal for kindness shown it as land. Fatten it by high and liberal management and it will as surely fatten you; hunger it and it will hunger you, and there will in that case be nothing left wherewithal to feed you. Do not kill the goose in the vain hope of obtaining the golden eggs; but preserve it, feed it, fatten it; for so in like proportion will you receive its ample, unlimited, and golden gift. Capital must be concentrated by employing it upon a less amount of surface. Let the 200-acre farmer confine himself to 150. The 150-acre man to 100 acres. If ordinarily good farming will barely pay, we may be quite sure low or poor farming will soon lead a man into ruin. Suppose a man to commence to farm 100 acres with a capital of £800, equal to £8 per acre; from this capital he may obtain a profit, more or less, according to his capacity for managing land. But suppose that instead of 100 acres he were to spread this same capital over a surface of 600 acres, equal to £1 per acre, would he not be called a fool? Well, then, is not this very same plan carried out on nearly all our Cumberland farms, in a greater or less degree, and does not the question, "But where is the money to come from?" too faithfully confirm this view? Reduce your surface, and thus increase the power and profit of your capital. By this means you reduce your outgoings in rent, rates, and labour; which amount of capital saved, you can expend in manure to be applied to your lessened surface, from which you will derive much more profit than from your previous amount of acres. Capital paid away in rent and rates gives little profit, but the same amount expended in manure enriches and blesses the spender. In exemplification of the above let us revert to our examples in "High Farming." The first example was that of an ordinary jog-trot farmer who takes his 50 acres of grass land. He manures not, he improves not, believing that it is the land only which yields the profit; who, faithful to his belief, satisfies his disheartened spirit by finding everybody in fault but himself—his landlord for exacting too much rent; the magistrates for wasteful expenditure of county rates, hardly earned by the sweat of this poor farmer's brow; the overseer for wasting upon the poor and charging him with too much poor rate, but of which rates, he is confidently certain, he could have laid out much more economically himself. Had this man, instead of finding fault with every thing and every body, immediately reduced his holding to one-half, he would have found himself in possession suddenly of sufficient available capital to pay for a good manuring to his land; thus doubling its previous production, carrying his previous number of cattle, as well as doubling his percentage on the rent, rate, and labour outlay. Gentlemen, my paper is a short one, but so also is the principle I have been advocating a simple one. It is simple and small, like the tiny spark applied to a magazine of gunpowder, which in its explosion may convulse a district. So also may this small but mighty principle of money-making which we are now discussing either enrich or convulse the world.

Mr. TORRIF, of the Pow, asked how it would be if all the farmers in England went into the market at once for three pounds worth of manure per acre.

Sir ROBERT said he went into the thing broadly, not in detail. He did not meet a trouble or difficulty half-a-mile off.

Mr. BANKS said that he was in hopes that some one would have risen after Sir Robert, to show what he agreed with, or what he disagreed with, for he was sure it was their president's wish that they should pepper away at his paper. He hoped that if "Verax" was present, he would now get up and say what he had to say, and not write anonymous letters to the newspapers; it would be much more honourable for him to do so. He could not say that he disagreed with the president, indeed he quite agreed with him upon high farming; but Sir Robert had so turned off the question of where was the money to come from, that he could not say anything.

The Vice-Chairman said he could add but little to the very luminous and philosophical address which they had just heard, but there were one or two points which had appeared to him that he had not treated upon. He had not stated particularly what constituted high farming. He thought he said that it was to obtain the greatest value for the land that they could. Now what had they to do after they had laid out £3 per acre in oilcake? Top-dressings on land he had found very uncertain. Were they to cut all their straw? Pulp all their turnips? Were they to have comfortable cottages for their labourers? If so, well might they say "Where was the money to come from?" He thought that if farming was found to be profitable the money would soon be forthcoming. Why should they not get money, as well as it could be got for draining bog land, for making railways, and, as it was found, for emperors and kings? If it were profitable to expend upon land, it would soon come; but he thought it would be difficult to find money to improve the whole of the fifty-six million acres of improvable land. There were some facts in the president's address which he should like to call to mind. Now what was the fact with those who had made a little money in farming? (A voice: Spend it.) They did not do as Mr. Mechi did—sell half of their land to pay for the other half. He thought that most of the farmers in this district had plenty of money, and he thought that those who had plenty of money were not so much better farmers than those who had not. In the parish where he resided, most of the farmers owned the land. Certainly it did not follow that they had more money; but he thought they were little better farmers than those who did not own the land they farmed. They should not consider a thing in a particular point of view. He thought their president had been very careful—too careful; but still he had not shown where the money was to come from.

Sir ROBERT BRISCO said that while some of the other gentlemen were thinking of what they would say, he would make a few remarks on what some of the speakers had said. First of all, Mr. Fordif had asked him a question, but which, by a little consideration, answered itself. They knew that if they all wanted to jump into a pit at the same time they could not do it. They knew that if everybody were in want of the same thing at the same time the demand would be enormous, and the price must go up, and in the natural order of things the demand would fall. A man must take such things as he can get them. For himself, he never admitted the existence of an impossibility. When it comes, meet it; vanquish it if you can; and if you cannot, then it is time enough to admit it. Sir Robert then went on to speak of what had been said about high farming having been tried. Well, artificial manures had been tried, and they had been a great mistake, but they had also been great hits. Where would much of their poor land have been had it not been for the artificial manures? But if he, as a farmer, were to go and buy artificial manures, say nitrate of soda, and should put some on a light, clean soil, and the next upon a wet, heavy, clay soil, what would be the consequence? He would find the nitrate of soda put upon the light soil had blown away, but he should see that upon the clay soil improve it. What did that show? It showed that he did not know his business. He could only say that the man who had tried them in a proper manner would find them to answer. Nothing verified the prejudice of farmers against artificial manures so much as guano. He remembered when, on its first discovery, it was stated that a small pocketful would almost manure a field. He and his friends tried it, and found it to be very fertilising; but such was the prejudice for a long time in his neighbourhood that the farmers would scarcely speak to him. But after a while, when he was going into Whitehaven, he would find some of the carts he met have a smell of guano; but it used to be covered up, as if they were afraid of its being seen. At first he was told that he was a fool, and that he was born with a silver spoon in his mouth. In using these manures, it required a vast amount of experience to know the sort of land a particular manure was fit for. They might throw their manure about, and let it run its chance of benefiting the land; but let them take care that they did not ruin their crop. Then as to capital, his friend the vice-chairman did not understand the paper he had read. They all knew that they did not cry out when they wanted money, and say, "Oh! furnish me with capital." The man who wished to be a high farmer found that he must have capi-

tal; and what did capital consist of? Why, it was money. Yes, and it was brain. The man who furnished brain furnished far more than gold, for money was of no use without brain. Then labour was capital; intelligence was capital; eye, and close attention was capital. The man who worked hard at his farm gave his labour, and thus put his capital into his land; but the man who had intelligence as well, and worked hard as well, used a larger capital, so to speak. A poor man going on to a farm must take land according to his means. It was not the land which gave the crop; it was what was put into it. The land was just the same as a tool in the hands of the workman, or the machine in the hands of the farmer. A man who has only £100 must not try to go at the same rate as the man who has £500. If a man has only £100, he must bring himself down to what his means will accomplish. He must consider how he is to do with it so as to increase it, and he must not do this by impoverishing the land, or he will impoverish himself. He must try to enrich the land. Had they not seen a man who began without a penny rise, and get above the man who had been "born with a silver spoon in his mouth." It was because he farmed with intelligence, and according to his capital. Returning to the question of high farming, the president said: Why, there is our vice-chairman; hang it, he is as bad as any of you. Why you are all high farmers to a degree. There is no such thing as standing still; you must go back if you do not go forward. Aye, and he tells us a great many things about small farms. I do hope that when our vice-chairman goes home to-night, and puts on his night-cap, he will give the matter his careful consideration. Sir Robert said he had spent a great deal of his life learning the little fact, how to make the best interest for money laid out. He found that it was this, to expend capital so that it might return again with something sticking to it. He did hope that he had now satisfied their vice-chairman.

Mr. GRAINGER said perhaps he might possess only a small "capital" in the shape of intelligence, but he was still unconvinced where the money was to come from. He thought he understood the president that a man with a small capital was to allow it to fructify by little and by little, so that in time he could take a bigger farm.

Sir ROBERT BRISCO said it might mean that or it might not. They ought to do as they did in the commercial world—concentrate themselves. A farmer's operations were so widespread; he had Jack working in one field, and Bill in another field half a mile off, and he could not be in two places at once.

The Rev. Canon HODGSON said he had come to learn something, and was sorry that so few practical farmers had risen to address the meeting. He quite agreed with what the president had said about the way in which manures acted upon the land; he thought they ought all to understand it. Mr. Hodgson went on to speak of the chemical changes which went on in land in producing the various crops. All straw required silica. In cleaning land, the farmer not only cleaned it of weeds, but he allowed the silica to be more exposed and set free. He spoke of the action of limes of various kinds and manures on lands, and the effect it had when both were applied together. Some knowledge of chemistry was necessary to be a good farmer. Their president had told them that he should not go into details; but he should have been glad if he had shown them how high farming was to be applied to small farms; for in high farming they had not only to have manure, but they had to have implements, and this took more capital. He knew a man who tried high farming on a small farm, with a small capital, but forgot that most of his capital was to lie idle for a long time, and ruined himself. Therefore he should like to know how it was to be applied. For instance, they could not have a steam plough on a small farm—not as a man whom he knew, who had a farm of four hundred acres in four fields. Speaking of the way in which capital might be raised, Mr. Hodgson said he once met a man who said that there was no way so easy of obtaining money as by a joint-stock bank.

Mr. WILFRID LAWSON said that even if he had had any strictures to make on the president's paper, he should have been warned by the fate of the vice-chairman, and not have made them. At the same time he must say that he was not more convinced than Mr. Grainger was where the money was to come from. As he understood Sir Robert's paper, it went to show that the money that the farmers have is not applied in the best manner. He understood it to be that they could apply their capital better if they would not lay it out over each

a large area. He thought that the president meant that the farmers tried to grasp too much. He meant to say that no man should take a farm which was too large for his capital. As to where the muck was to come from, Sir Robert did not give them any answer to that little question.

Sir ROBERT: I have already answered it.

Mr. LAWSON said he hoped that this discussion might do much good. There had been a great deal of discussion in this part of the country lately, which he, having been from home, had not the pleasure of hearing. They had had Alderman Mechi amongst them, and he thought many of his remarks very good; but he thought that these great agricultural authorities laid down too rigid rules to be applicable to the country all over. Farming in Essex might be very different to farming in Cumberland, though he believed that the day would come when steam ploughing would be the rule. We all knew that there was a place for everything, and small fields and hilly lands were not the places for the steam plough. We have had a steam plough in this neighbourhood, which had, he thought, hardly been equal to the expenditure. It had hardly, he thought, done the great things expected from it (smiling, and looking towards his brother, Mr. Wm. Lawson, who has been the first to introduce the steam plough in this neighbourhood). When he considered that, he was reminded of an anecdote of a horse dealer, who sold a horse to a gentleman. When the bargain was made, the gentleman said, as the horse was sold, the dealer might just tell him candidly what faults it really had. "Well," said the dealer, "he only has two faults: when he is out in the field he is very bad to catch, and when you have caught him he is of no use." So it was with the steam plough; it was very expensive to get, and when it was got, it was very bad to get to work. Speaking of the judicious application of capital to land, Mr. Lawson said he hoped to see the day when more capital should be invested. The more they all did to cheapen food for the people the better. He thought that the paper read by the president would tend to advance the day, and begged to move a vote of thanks to Sir Robert Briscoe for having contributed it.

Mr. LAMPART, of Wigton Hall, said he hoped that it was not necessary that those who rose to address the meeting should be expected to be teachers. He did not know what was a practical farmer; but he thought that the man who farmed low and the man who farmed high were each practical farmers. The president took up high farming; the vice-president favoured low farming. The president encouraged an idea which, if carried out, would leave half of the country out of cultivation. [A Voice: No, no.] Surely this must be the case. If the farmers are at present farming too much land, who is to farm the other half? [A Voice: Other tenants.] He thought Sir Robert ought to have gone on, and shown where the other tenants were to come from. They must also be able to show a profit, for the question resolved itself into this, Does farming pay, or does it not? He thought with the vice-president that, if farming were profitable, the capital would soon be forthcoming. They had "limited liability" companies of all kinds, and a reckless crop of schemes in everything except agriculture, and he thought that if it had paid they would have had the same for agriculture. But if high farming was not profitable, how would it be with low farming? Mr. Lampart said he had never met with a farmer who kept a proper set of books, and he thought that no farmer could say whether his farm were profitable or not. He thought that high farming was not profitable because capital did not come to it, and that low farming was not profitable because they did not gather up money. Agriculture, he thought, was stationary in this country amongst small farmers. This was a melancholy state of things, and, combined with the exodus from Ireland, led to the consideration of the question as to whether the land there was actually worth cultivation at all or not. He should be glad if any farmer could tell him his real profits; it would help them to come to conclusions better.

Mr. RIDLEY, of Carlisle, said he thought, before high farming could be carried out to the extent to which the president said it ought, that the land ought to be properly drained, and the farm buildings remodelled. Then he would just ask the question, could the whole produce of the land be consumed on the farm? If that were done, he was sure he could find fifty men in the room to adopt the improved system. He would say that the tenant was not the man to improve a farm for the landlord. He thought a tenant should put something in his pocket, instead of laying it out on the land, when per-

haps they would be called upon at the end of their lease to pay an increased rental. The landlord immediately took advantage of the intelligence of the farmer. High farming went into the pockets of the landlord.

The VICE-CHAIRMAN said that those remarks brought up the question of tenant right, and he thought that the farmer should have a claim for unexhausted improvements, as well as the landlord his claim for dilapidations. He should be sorry to be considered to be the advocate of low farming; he had tried to follow the President in his remarks, but still he thought that the only direct answer to the question, "Where's the money to come from?" had come from Canon Hodges, when he said the joint-stock banks.

The Rev. CANON HODGSON seconded the vote of thanks to the President.

Sir ROBERT returned thanks, and replied to some of the remarks which had been made during the discussion, and he was glad to say some pertinent questions had been put. As to the remarks of the gentleman from Carlisle (Mr. Ridley), he thought he could not have been in the room when the early part of his paper was read, as he had devoted a great part of it to that foundation of all good farming, drainage. He had said so, and also that it was really a landlord's question; that, he hoped, was an answer to that question. As to the other questions, if he had gone into *minutiae* he might have talked until he had no voice. Everything earthly had to be guided by principle. Whatever was wanted came; whenever a change was needed it came. So with farm buildings, if they had been needed they would have been built, but he did not think that high farming required more farm buildings than low farming does. He did not approve of many of his own farm buildings, but he was not going to expend perhaps £12,000 over re-building them on his farms, until he saw that they were required, and he had the right men to put upon them. He did not let his farms merely to the highest bidder. He always wished to be sure that he was a safe man. Before he let anyone a farm, his excellent steward, Mr. Kay, went to see the style the man farmed in, and he took care to be perfectly satisfied before he let his farm. If he found men who could farm well he should lay out the money, but not till then. Some men would want large barns, while another would say a Dutch barn was the thing for him. The owner of the land must judge for himself how his land must be improved, and how his money is to be expended. Their Vice-President was most pertinacious in sticking to old opinions. He says that Mr. Hodgson was the only one who pointed out how the money was to be got—from the joint-stock banks; but if so, somebody would have to sweat for it. He never intended to show them a pit full of money, out of which they might help themselves; but the capital he spoke of must be produced by themselves out of their own labour, and by their own intelligence. He was sorry to hear their Carlisle friend talk about putting their money into the landlord's pockets! To talk of that to Cumberland farmers, who were not such a set of fools as to let anybody put their hand into their pockets! A landlord, however, must have the value of his land, and the farmers farm for their own profit, and they could not do that without improving the value of the land. Sir Robert told how Mr. Coke, of Norfolk, managed in letting his land. He had increased the value of his family estates threefold. He would allow no tenant to go upon a farm unless he could prove to him that he had sufficient capital for it, but found him suited to his means. As to the subject of implements, Sir Robert said that would form matter for a paper of itself. The only reason for putting an implement upon the land was to save so much in labour. There was Mr. William Lawson: he did not put a steam plough upon his land to show them how it was possible to work it; it was to see if steam culture was more profitable than horse power; and he looked upon Mr. Lawson as a great benefactor to this county, at a great cost to himself. In conclusion, the President said there were other questions which he had no idea of shirking, but if they took this paper for their text there might be 500 papers written upon 500 different questions; and when they had satisfactorily settled these, they would find themselves very wise men indeed.

At the close of the meeting, Mr. Lampart, of Wigton Hall, agreed to read a paper on "The commercial spirit applied to farming; or, an answer to the enquiry, 'How the capital for improvements may be obtained?'"

GROWING, STORING, AND CONSUMING ROOT CROPS.

KINGSCOTE AGRICULTURAL ASSOCIATION.

Mr. F. Burnett introduced the subject for discussion. Mr. J. T. Harrison occupied the chair.

Mr. BURNETT said:—Having on a previous occasion introduced for discussion the subject of mangold cultivation, my remarks this evening will apply chiefly to the cultivation of swedes and turnips, the successful growth of which depends more upon moisture than, perhaps, that of any other crop; hence we find those localities with the greatest falls of rain most productive. The soil and climate of the Lothians of Scotland and the North of England are the most suited, while the dry atmosphere of the South-east of England is better suited for wheat, and, perhaps, for cereals generally. The west and south-west are by far the most favourable for roots.

THE SOIL MOST SUITABLE.—The expression "turnip-soil" is a very familiar one, but it may mean anything if we are to believe a statement of Mr. Huxtable, that it is possible to raise a root crop off a deal table. I believe roots can be produced on any soil, and that on arable farms they are indispensable. A good turnip soil is a brash or sandy loam, with a porous subsoil, which is easy work for two horses to plough, dries quickly after rain, and yet does not burn in dry weather. Swedes will flourish on a heavier soil than turnips, which is consistent with their slower and firmer texture. Until the last three seasons mangold has succeeded on almost any soil, except very light sands and gravels. The soils best suited for them are rich loams, clayey loams, and good peat soils. On heavy lands where swedes and turnips are uncertain, very large crops are produced. The great secret of all root crop growing is to hit the season, and this cannot be done unless we are ready for it; therefore no time should be lost after the crops are off, whether light or heavy land, in having the cultivator or paring plough set to work (the former I prefer), going twice over it in different directions. Cultivating or paring answers several useful purposes; it arrests the couch roots before they have a deep hold of the ground; the want of air keeps the roots near the surface when the corn is growing, and instead of burying them keeps them on the top, ready for the harrows to work. After a few dry days all the rubbish can be raked off, and burned in large heaps, and we all know how useful ashes are to mix with artificial manures. The breaking of the surface soil in the autumn is of great advantage to the working of the land in the spring, much less labour being required to produce a fine tilth, and a saving of labour in the spring is of great importance. Our next operation is to have the dung hauled out into small heaps, enough for about two acres. The system of wheeling is to be recommended in all seasons (especially in a wet one); so in the system of having one year's dung in hand. Theory laughs at this, but practical facts are stubborn things. I need hardly say the sooner the land is ploughed the better. The depth must depend on your soil, although I am an advocate for deep ploughing for root crops, yet to break all the pan, or whatever it may be called, that is between the ordinary depth of furrow and the rock, I do not advise. Experience and the theory of ploughing all soils ten or twelve inches deep do not agree. Once ploughed, or once cultivated in the spring, will, in most cases, be sufficient, when the land has been left in a good state after autumn cultivation. If much work is required in the spring the moisture will evaporate, the soil becomes so loose and hollow, or so hard and gnarly, that the crop of roots become a decided uncertainty.

APPLYING THE MANURE.—In all the most successful root-growing localities the ridge system is invariably adopted, the farm-yard dung and part of the artificial manure being put inside, especially when guano is used, that it may not come in contact with the seed. Bones are also better put inside; if not, the roots carry a large quantity of them away. A mixture of farm-yard manure and artificials are better than either sort alone themselves. There is also a great advantage in the ridge system enabling the horse-hoe to be worked at a much earlier period, whereby the weeds are destroyed and a new

surface exposed to the air. The width of the ridges ought to depend on the amount of manure you intend to put. If your object is to grow large roots and a great weight per acre, 28 inches seem to be about the width, where from 28 to 30 tons have been grown.

The system of cultivation I have mentioned only applies to cultivation after a straw crop. Turnips after sainfoin is a general rule on the Cotswold Hills, and the system of preparing the land is worthy of imitation: although at first sight it may appear very expensive, yet I believe it is the most economical system. [Mr. Burnett gave details of the system, and then stated in what cases a green spring crop can be profitably introduced before the root crop.] On farms where a large flock of sheep is kept, it is very advisable to have a spring crop, such as vetches, rye, or rape, to supply food after the roots are eaten, and before there is sufficient grass. This can only be done where the land is perfectly clean, and of a rashy nature. The impossibility of cleaning the land, either before or after, has hitherto been, and I fear will be in most seasons, a great hindrance to a large breadth being sown. In theory it is very good, that instead of land being idle so long, it might as well be producing something for the stock; but as the successful production of the root crop is the first step toward profitable farming, we must be careful to put no impediments in the way, and if the green crop is late, it interferes with root-sowing, although I have grown very good crops of turnips; and the best I have seen this season is after vetches, where the soil is an easy working brash, free from weeds, which can be sown with vetches immediately after harvest, so as to be ready early. They are then of great value, and the soil will have time for the necessary rest before the turnips are sown.

THE TIME OF SOWING.—This varies with the climate. The farther north or the colder the climate, the earlier ought to be the date of sowing. The time for sowing swedes on the Cotswold Hills is from the middle of May to the middle of June; turnips from the middle of June to the middle of July. A few turnips for early use may be sown before the time mentioned. Swedes sown in the middle of May in the Vale would, three seasons out of four, be attacked with mildew. This is the case in all warm, rich districts, and sometimes in what we call the poor, cold districts, they get what they call at Berkeley the whitemouth. The frequent use of the horse-hoe is the best check for the disease, or what is called paring in Scotland, that is taking a light furrow from each row. Where large quantities of turnips are grown it is often difficult to get over the work within the time which is best suited for growing the heaviest crop; it is therefore preferable to commence a little earlier in favourable seasons, as unfavourable weather may set in, and it is of the greatest importance to have a fine seed bed.

THE QUANTITY OF SEED PER ACRE: 4 LBS. OF SWEDES AND 3 LBS. OF TURNIPS.—It is advisable to sow much more than would be required, for a thick crop of plants grows the most rapid at first, and gets out of harm's way from the fly. In all cases, whether put in with the drill on the ridges, or on the flat, two cwt. of superphosphate, or some other similar manure, mixed with ashes, should be put in with the drill; this either gives the fly a good supply of food, or drives them on so fast that there is no food at all. On light land a roll should follow the drill. This keeps the moisture in the land; but on heavy land, and especially when rain falls soon after, the compressed surface will not readily admit the water, and the land runs together, and roots seldom do well. When the plants are thick, hoeing must not be deferred too late. First the horse, then the hand hoe should be applied. I have said nothing about the quantity or the different kinds of artificial manure that it is advisable to use. So much has been said on the subject that I feel inclined to say little; but I am sure the farmers in this neighbourhood lose more from not using a larger quantity than by using too much. I doubt not but there is a loss in not knowing the right sort to use. All experience has shown that turnips require four great manuring principles

to be successfully developed. 1. Carbonaceous matter supplied by farm-yard manure. 2. Ammoniacal manure, supplied by bones, guano, &c. 3. Phosphatic manure. 4. Sulphuric acid. As I have said before, I believe in a mixture of manure for a root crop, and would advise ten loads of well-made farm-yard manure, two cwt. of guano, or eight bushels of bones, and two cwt. of superphosphate, or some other similar manure, with as much soluble phosphates as possible. [A diagram showing the value of manures per ton was exhibited.]

METHOD OF STORING.—I think there is no better plan than that adopted in this neighbourhood. Those roots which are to be fed on the land from the 1st of December to the end of February, are put into pits with only the tops cut off; those for feeding off after that time are put into furrows made by a plough, and another furrow put on them. In March they should be taken out of the furrows and put in heaps, the growth of the shoots being thus checked. By using an extra quantity of manure an extra crop can be produced, whereby the farmer is in a position to have some to haul off to be consumed by cattle. The quantity required should be taken off in strips across the field, that the whole field may have an equal dressing with the sheep; and when taken home they should be put in houses or heaps and thatched.

METHOD OF CONSUMING.—From what I have said, you will see that I mean the greater portion of the swedes and turnips on light soils to be eaten on the land by sheep, and I have no hesitation in saying that the most economical system is to have them cut by Gardner's turnip cutter. The saving of food and the advantage to the animals from having their food in a prepared state, will amply repay the extra cost. Roots contain a very large quantity of moisture, and the more hay, corn, and cake the sheep eat, the better it will thrive. I believe that no animal pays better for the consumption of corn when on turnips than sheep. Whatever may be the wants of the body, an animal kept on roots alone can only supply himself with such elements of food as the root contains. Pulping the roots and mixing them with chaff for sheep has been advocated, but I can see but little if any advantage in it, unless one has a large quantity of inferior hay and but few roots. I had the hay cut into chaff for two years, but gave it up, believing it was a step in the wrong direction. With regard to mashing and cooking roots for cattle, sheep, and horses, I believe no advantage whatever results, and that the labour and fuel are entirely lost. It is only natural to suppose that the powerful digestive organs of these animals are suited for the consumption of roots in a raw state. The pig is altogether a different animal, and it is advantageous to prepare his food. As roots are cheaper than meal there is a decided advantage in using them mixed together. Store pigs will do well on swedes or mangold without being boiled or cut. For horses and cattle I know of no better plan than pulping the roots and mixing with chaff. I find I can keep store cattle in good condition with 28 lbs. of pulped swedes, and the same quantity of straw cut in chaff every day. But the quantity of food required depends very much on the position the animal is in. It is well known that a certain quantity of food is used up in preserving the animal temperature, therefore the colder its position the more heat is abstracted and the more food or fuel is required to maintain it. This is quite in keeping with science—that animals thrive better when housed; therefore it is important to have shed room for all the cattle on the farm. I feel sure there are few landlords in this neighbourhood who would object to build extra accommodation where required, the tenant paying a fair interest for the capital invested.

Mr. D. HOLBOROW recommended autumn cultivation, and deep winter ploughing, and generally coincided in opinion with Mr. Burnett. He, however, did not use artificial manure with his swedes this season, and yet he grew a heavy crop. He hauled some of the roots home, and consumed them with straw, hay, and oilcake, thus preparing a valuable supply of manure for the next root crops. His cousin, Mr. Holborow, of Tresham, was not in the habit of topping his swedes when he put them in heaps, and found the plan answered. His own experience did not coincide with this, but it was wet weather when he tried the experiment, which, probably, accounted for the unsatisfactory result.

Mr. THOMAS PARCE differed from Mr. Burnett in recom-

mending deep cultivation before winter as a general practice. His land had a substratum of brash, into which the rain would too rapidly pass if he broke through the intervening pan, carrying with it valuable manuring substances. His practice was to skim plough before winter and deeper in the spring, and he did not find any trouble in obtaining a fine tilth.

Both Mr. HOLBOROW and Mr. PARCE, in reply to a question from the chair, urged the importance of patience at sowing time, as they frequently found that when the seed was sown and was followed immediately by heavy rain, the soil was apt to cake on the surface, which greatly retarded the growth of the plant, which, becoming unhealthy, was attacked by the fly; whereas, seed sown a day or two after, shot away rapidly and was soon out of danger.

Colonel KINGSORZ thought if land was to be ploughed deep it ought to be in the autumn. If part of the pan that was spoken of was to be brought to the surface, the earlier it was done in the season the better, that it might be shaken by the frost, and well pulverised by the seed-time. Very little had been said as regards liquid manure drilling. He knew they did not adopt that system in this neighbourhood, yet he was not sure but that it would be a step in the right direction. He was told in Leicestershire that they now derive a great benefit by using the manure in a liquid state.

Mr. R. NICHOLLS also agreed with giving the deepest furrow in the autumn. If he was to plough deeper in the spring it would require much work; he would not have time to accomplish it so as to get the root crops in in proper season. He was rather averse to using the manure in a liquid state, believing that on their very porous soils the first heavy rain washed the greater portion of it away.

Mr. LONG, of Berkeley, said little had been said respecting the turnip fly, which, in the vale of Berkeley, was the greatest pest they had. He had tried a very simple plan, with success. He got a boy to draw an elder bush up and and down the rows. Where he did this the fly did no injury, but twenty rows not so brushed were entirely carried off.

Mr. FORD also said he had used the bush with success.

Mr. H. BURR thought the quantity of seed recommended extravagant. He used about 2lbs. per acre, and he thought that was about the quantity used by most present. He knew the thicker the plant the faster it grew, but unless the plants were singled out very early thick sowing was injurious.

The CHAIRMAN said the time for closing the meeting was now up. After the practical discussion, to which he had listened with the greatest interest, he would propose the following resolution, which was unanimously carried:—

Resolved—That this meeting is of opinion that the most economical method of growing, storing, and consuming the root crops (on the Cotswolds) is

1st.—Autumn cultivation immediately after harvest, using the skim plough or cultivator twice in different directions, collecting and burning all the rubbish in large heaps—the ashes from which should be mixed with artificial manure, and drilled with the seed.

2nd.—The dung kept from the preceding winter should be hauled on to the land and placed in heaps sufficient for two acres.

3rd.—The land should be deeply ploughed before winter, but the actual depth of the ploughing must depend upon the nature of the soil.

4th.—That the land be ridged in the spring, the manure being wheeled from the heaps, and spread in the furrows, and bones or guano sown by hand on the manure—that the bouts be then split, covering the manure.

5th.—That 2 cwt. of good superphosphate of lime (containing a large per centage of soluble phosphates), mixed with ashes, and 4 lbs. of swede seed, or 3 lbs. of turnip seed, be drilled to the acre, on a fine tilth.

6th.—That the horse and hand hoes be set to work early, the crop being hoed three or four times.

7th.—That a grain crop preceding the turnips can only be taken economically when the land is clean.

8th.—The swedes to be fed off on the light land by sheep, should be picked up, put in small pits, and covered with

soil, or in furrows, covering them with the plough; the swedes should all be cut by *Gardner's* cutter.

9th.—The mangel to be consumed by cattle should be hauled before the frosts set in; also the swedes from the heavy land—the former stowed in large heaps, covered with soil, and thatched, the latter in smaller heaps.

10th.—The roots consumed at home should be pulped

and mixed with chaff for the cattle and horses—for the pigs the roots should be boiled.

11th.—All the cattle should be comfortably housed.

A vote of thanks to Mr. Burnett for his interesting lecture, and to Mr. Harrison, the chairman, closed the proceedings.

ON EARLY SPRING SOWING.

BY A PRACTICAL FARMER.

As this almost-unexampled winter is progressing so satisfactorily, and all farm-work is proceeding as expeditiously as in early spring, a few words relative to early sowing may be acceptable and useful to many of our readers.

Farmers are often tempted to deviate from a sound and safe course of management, owing to some adventitious circumstance, or some suitability of the season or condition of the soil. Those farmers who yield to such temptations must be looked upon as speculators. Solomon says, "There is a time to sow;" but had Solomon lived in our fickle climate, it would have puzzled him to have fixed it. Be that as it may, we know from long experience that there is a time when it is not safe practice to sow any spring grain till most of the winter vicissitudes have passed away, and the bright spring is betokening its appearance. Successes have occasionally rewarded the adventurer—sometimes remarkably so. At other times he is woefully foiled. This is not business-like: it is gambling, or analogous to it. My object in this short paper is to warn these speculators for their good. I have more than once been tempted to sow early—i. e., in the early part of February. The temptation has been great—the weather fine, the land in prime order, the cart-horses quite at liberty, nothing else to do. Could I do better than get in my seed? I have done so. Heavy falls of snow have followed, succeeded by drenching rains and rapid thaws. Much of the seed has thus been destroyed, and the remaining so injured that what came up was weak and sickly, and stood poorly the succeeding frosts and cutting winds of the early spring, and ending in a defective crop. Having learnt a little wisdom by dear-bought experience, I give the result, for the benefit of other impatient and early sowers.

So far as my experience goes, I should advise that no spring grain shall be put into the ground earlier than the last week in February, be the temptation never so great; and even then, should the weather become cold and wet, the seed lies in a precarious state. It cannot vegetate. There it lies, subject to every vicissitude of the season, and the depredations of grubs and birds; and when it does grow, it is not with vigour, but slowly and unpromising. It is far better to wait the return of genial spring, and then, with all the power of the farm, and longer yokings, get all in as quickly as possible, consistent with the proper working of the land.

The first sowing should be the oat sowing. The oat is slow to vegetate, and in its early stages grows slowly. It is also hardier in its character than other spring grain; and if the sowing is liberal, no great danger will arise to prevent a good plant being realized. The pea sowing should then follow. The pea—i. e., the common field sort—are next in hardihood. These, being put in at a good depth, will be many days making their appearance; so that the season will, in all probability, be sufficiently advanced, and the weather warm enough to promote their successful progress, which is so essential to the prosperity

of this crop, it being necessary to its full development and profit that it should not receive a check, from the time of its sowing to harvesting. The barley sowing should next be completed. It is, however, immaterial as to which has precedence, either the barley or the bean sowing. The barley is to be preferred, as being more easily got in, and taking less labour than the bean sowing. The land, also, intended for barley is generally in a lighter and more freely-working state than bean-land; neither does it require to be put in so deeply as oats and peas. It is soon up, and grows with greater rapidity than any other grain, and is consequently more liable to injury from cutting winds or late frosts. The bean sowing may come last; but it is all the better to be got in before the month of April. As bean-land is generally clay or stiffish loam, it requires more working, and for this reason may give place to other grain, which ordinarily can be got in with greater expedition. However, most farmers are guided in their work by the time and manner of its falling in. The green crops may not be eaten off, thus preventing the oat or barley sowing, or the manuring for peas or beans, which has not been completed, and so these seedings are deferred. My remarks, of course, refer only to cases where no such hindrances occur. The same observations may serve to show the futility also of thus early preparing the land for spring-seeding. It is folly to plough so early, and lay up the land preparatory to a spring-seeding. The like unfavourable weather may prove the work abortive. It may be desirable to plough lightly the land upon which a bulky crop of winter food has been fed off. It preserves the value of the sheep's dropping for the soil, but generally such land should be reploughed before seeding.

It may be observed that good subsoil drainage does in a great measure make a farmer independent of untoward seasons. This certainly is the fact, and, to a certain extent, he is able to act upon it. He can, undoubtedly, get in his sowing with much greater facility and certainty than the farmer who cultivates undrained land; but still, atmospheric influences are against him. It is more prudent to wait. Witness the power of a keen frost upon the young plants—how brown or iron-coloured they look; what numbers die, and what a length of time elapses before the general crop recovers its healthy appearance. Besides, if the other view is taken; suppose the season waited for is propitious, and the seeding is all got in advantageously; the March dust and April showers give every aid that can be desired to promote the safe and speedy growth of the crop. All goes on simultaneously, all goes on evenly and kindly, and all alike is brought forward to perfection, so that at harvest day a splendid and profitable crop may with tolerable certainty be anticipated and reaped. The present is a tempting season, and no wonder if many inexperienced or speculative farmers give way to the temptation—most probably to their hurt. I, however, say no more than this—that they have their warning through these pages, and therefore our duty is done.

CERTIFICATES OF CHARACTER TO FARM SERVANTS.

If an alteration takes place in the Law of Settlement that will enable servants to go to a distance where they are not known, a certificate of character as to moral and professional qualifications will acquire a greater degree of importance (in our English provinces at least) than it at present possesses. The question is surrounded by innumerable considerations, whether it is examined from the master's point of view, the servant's, or that of the general public; and, therefore, it requires timely discussion so as to be practically understood by those who have little or no experience in the matter.

As to the position of the farmer, his industrious pursuit is very differently situated as to the supply and control of labour from that of the other arts, generally speaking. In this respect agriculture may be compared to a combination of several arts, each carried on separately from the others, but all within the area of his farm. Thus, the cattle department, whether the stock is a breeding or fattening one, requires to be divided into several minor ones—the sheep, for example, being under the shepherd, and the oxen under the cattle-man. Pigs and poultry frequently form another division. Horses and their management involve a long series of occupations; so do field operations in seed-time, hoeing and harvest under the common labourers. Again, there are the operations of the barn and stackyard. To control all these departments the farmer would require to be either in half-a-dozen of places at one and the same time, or else have many overseers—neither of which is practicable; consequently he is less or more at the mercy of his workpeople. If they are honest, well-disposed, industrious, and professionally qualified to perform their respective functions upon the farm, the whole may go on smoothly and profitably, but a single rogue hired in from a distance may render it the reverse. With this most farmers are less or more familiar; hence, when they belong to the parish, and are known, the *black sheep* are either avoided or kept under by special provision; if they are daily or weekly servants, or jobbers on task-work, they can be dismissed the moment they break loose themselves, or in any way hinder or lead their fellow-workmen astray. But when one comes from a distance, and is engaged for six or twelve months on the faith of a certificate that he is trustworthy and a good hand, there, it may be, more difficulties in the way of getting rid of such a fellow than many at first sight may imagine; for, if dismissed without ceremony, he may in a court of law succeed in getting wages and board wages for his full term off his employer, besides expenses.

Servants, on the other hand, are often better informed in a bad cause than in a good; and this is more especially the case with the greatest rogues, who, professionally, may be excellent hands. This class of workmen often entertain extravagant notions of their own moral and professional qualifications. A very general but erroneous belief prevails amongst them that their employers are in duty and by the law bound to give them a "character;" and if they do not receive a certificate to suit their purpose, are gifted with no little ingenuity in finding fault, devising mischief, and getting their old masters into "hot water." There are others again in the opposite extreme, who may not inaptly be termed "*simple ones*"—ordinary hands who have not a sufficiency of independent spirit to demand their just rights, when these are denied them by ignorant or unprincipled masters.

Under such circumstances, what value can a thinking public place upon a certificate of character? The only answer, we fear, that can be given to this, in a strictly practical sense, is *none at all*. In those provinces of the North where the unmarried hands are engaged for six or twelve months, and married men for the latter period generally, and where servants are at liberty to go where they will from place to place, as it suits them, certificates of character are seldom worth the paper on which they are written; and the reason is obvious, for, owing to the prevalence of immorality, and the liability of the most trustworthy and skilful hands being led astray, farmers are obliged to write certificates in a style so general and often vague as to keep themselves safe. It is no uncommon thing

for a farmer, when he is asked to give a certificate, to take the man into his office, and after having shut the door, to tell him, in plain language, something as follows: "John, you know perfectly well I cannot give you a certificate that will be of any use to you"; and for John to answer, "Well, I'm but too sensible of that, but what can I do? I cannot leave without a character; just make it as good as you can."

This is not a favourable view of the question, either for master or man, much less is it one that ought to be allowed to remain the general rule. No doubt there are many examples where employers can and do give to those about to leave their services highly satisfactory certificates, with reference, and where the latter leave under the gratifying conviction that they can confidently refer back to their old masters; but, unfortunately, as yet they, numerically considered, must be pronounced the exception.

To make the exception the rule is, therefore, the general practical problem. In its solution there is, doubtless, much error on both sides, on the part of the master as well as on that of the servant, that requires correction. A system of reference, with a general certificate as above, has long been advocated by many farmers, and acted upon by not a few; and unquestionably, reference, where farmers have an opportunity of meeting each other, or by a written application when they are personally acquainted, is a preferable course to a certificate only; but when they are strangers, and have no opportunity of seeing each other, it is otherwise, for then reference becomes a very problematical solution of the question, nine cases out of ten perhaps ending in disappointment to both parties, the employer and employed. Thus, what one farmer, A., would conscientiously consider a good hand and a first-rate moral character, a second farmer, B., would consider the very reverse—a much worse hand, morally and professionally, than the one he has parted with, because Mr. A. is a blustering beer-swilling bluff himself, whose farm practice is antiquated by more than half a century, and whose judgment is so obtuse that he cannot distinguish between a good or a bad ploughman; ditto, ditto as to cattle, and everything else. At the same time, he is a downright honest, jolly fellow, who speaks the sentiments of his own mind without equivocation or ambiguity; but the man requires to be known to be practically understood. This is the whole secret of the matter, and our practical readers cannot fail to understand it. Mr. B., on the other hand, belongs to the go-a-head school, morally as well as professionally, and is, in point of fact, in the true sense of the much-hackneyed phrase, a successful scientific and practical farmer; and had he only known that *old smock frock* had served Mr. A. satisfactorily for a second term, he would have never asked him to engage as his servant.

The question at issue thus resolves itself into the old proverb, "*Like master like man*," and the elevation of the majority to the moral and professional level of the minority, in both cases. The position at first sight may be thought an unfortunate one for the agricultural interest to occupy; but when farmers reflect for a moment on the "broad road" and the "narrow way" and the respective travellers therein, they have much reason to be thankful in taking a comparative view of their own case with that which prevails in our large manufacturing and commercial towns amongst other classes, and therefore to double their earnest and prayerful endeavours at the present time in the great work of reformation, which the practical solution of the question contemplates.

Alike to "master and man," the practical solution of the question comes home—a personal work which each has to perform. In the case of the former, it is often humbling to hear practical men descanting about certificates to their servants when their own conduct will not bear a close investigation. In many cases it is even manifold worse than this; for they not only set a bad example before their workmen, but in innumerable cases teach them by precept the most immoralizing that can be imagined, which too frequently lead thoughtless and unguarded servants into dark avenues of vice, from which they can never afterwards extricate themselves. Thus, in the

delivery of the produce of the farm, servants are taught how to conceal inferior quality; how to fill the bushel to their master's advantage; how to conceal blemishes in live stock sold, and to catch at all hands in purchases for the farm. And to effect such, intoxicating drink in overflowing abundance is allowed. Again, in the labours of the farm how often do farmers place more faith in "beer" or "whisky" (as the case may be English or Scotch) to get plenty of rough work out of their hands, than in morality, professional skill, and certificates! And such, too, is attended not unfrequently with that most anomalous of all anomalous phrases—"a good swearing" when any of the poor wretches fall below what is thus expected of them. Unless the principal hands can give the beginners and those over whom they have a certain charge a good swearing they are not considered qualified for the peculiar situation they hold! Now, so long as such a humiliating condition of things exists, neither certificates of character nor reference can serve the demands of practice under consideration. The work of reformation may end in such instrumental means being eventually adopted; but unquestionably it does not begin there, for until farmers look upon intoxicating drinks, good swearings, and dishonest dealings as a disgrace to their profession, their certificates or references will remain worthless in the estimation of an enlightened public, and less than this in the eyes of the more intelligent of their own body, to whom such certificates, &c., may be professionally addressed. On the other hand, in the case of those farmers who extend towards their labourers an instructive example, morally and professionally, their grand object is to get a proper staff of labourers resident upon the farm; and when any change takes place, to avoid, by every precaution means in their power, contaminating the whole by the introduction of immoral and unprincipled strangers. For this purpose, it has been proposed to have county or provincial registries, where the names of proper servants could be entered, and through which office a farmer could always procure a trustworthy servant for a small fee, the servant's entry being nominal, and none being registered without a suitable guarantee.

With regard to the case of the servant, his conduct, morally and professionally, is singularly illustrative of fallen humanity. Generally speaking, the reformation of farm-servants, as a class, has been too much treated as a public question and too little as a personal one; and what is even more to be regretted, both views have been canvassed too much in the spirit of philanthropy, and by far too little as a question of self-interest and physical welfare. Farm work is heavy and ex-

hausting, but in the highest degree health-giving, under proper food, clothing, and household accommodation; and when the labourer resides upon the farm, and is thus liberated from the seducing allurements of towns and villages, our farm cottages furnish some of the brightest examples of christian life that are to be met with. Now, if one farmer can secure from half-a-dozen to a dozen of cottages of this description, and carry on his farm operations with the highest degree of profit and satisfaction—and this we are prepared to prove—why should not such become the rule, instead of remaining the exception? In this, servants are even more deeply interested than their employers; and so far as our experience extends, which embraces a large portion of the three kingdoms, we have always found the vast majority earnestly desirous of coming up to this golden rule, even in those cases where they were evidently, at the time we conversed with them on the subject, a long way below it. The contrary would be alike unnatural and unreasonable, for they feel their present low condition more perhaps in a physical sense than in a moral and religious. The parson's daughters and wealthy lay dames of the parish may visit the family of the poor man in the village, and preach morality, religion, and even the worldly wisdom of a redeemed or an unblemished character, till doomsday, and leave tracts of Christian example from both the Old and New Testament times; but such is at the best a species of mockery, so long as the labourer is confined to the village, and has there to provide for himself and family on means which heaven and earth conjointly pronounce "inadequate for the purpose," with more dreary prospects ahead than what his experience leaves behind; for thus cooped up in a village hovel, with perhaps only two apartments, on the principle of a pig's sty—one to eat in and the other in which to sleep, and in the midst of associations the reverse of those which the golden rule requires, the poor man's head is so kept under the water that he cannot draw breath. Setting aside the religious question altogether, in order to isolate and exhibit in their true light the others, how can he redeem either his moral or physical character under such circumstances? All who know anything about the physiological requirements of the labouring man must pronounce it "impossible." INFINITE LOVE may snatch his soul as a brand from the burning; but before landowners and tenants can effect a moral and professional improvement upon the living organism of the man, they must place him in possession of means similar to those whose conduct we have quoted as the golden rule, before they can expect a satisfactory result.

ENGINEER.

SHEEP FARMING.

At the Morayshire Farmers' Club the following paper was read:—

Mr. GEDDES said: At the request of the committee of management of this Club, I have drawn up a short statement of the management of, and the probable profits to be derived from, a breeding stock of sheep, in this county, upon an arable farm of average quality of land. For the sake of data to go upon, I have taken the extent of the farm at 200 acres, farmed on the usual five-course rotation, and where a breeding stock of 10 cows are kept, for the purpose of supplying the establishment with milk and rearing calves to be sold as yearlings, and, where a larger stock of cattle can be kept during winter, these cattle to be fed on the turnips which can be spared from the sheep, assisted by a few tons of oilcake, or other feeding stuffs. I may likewise state that the committee, feeling the present very unpropitious state of matters for corn-growing, have kept in view that our attention must be more and more given to cattle and sheep, and, therefore, that any discussion at this Club which may tend to elicit information with regard to the production and practical realisation of money from live stock, at this time, may prove to be of service to the agriculturists of this district. Without further preface I shall therefore say, that for the last twenty-five years I have practised sheep-farming in this county, and, during that time, have made repeated trials of various breeds of sheep, but have come to the conclusion that the most profitable for this district are what is

called the half and three-parts bred sheep—that is, the first cross between the Cheviot ewe and the Leicester tup for the half-bred, and this ewe crossed again by the Leicester tup for the three-parts bred sheep. I have tried the pure Leicester, the pure Cheviot, and pure Southdown, a cross between the Leicester and Southdown, likewise a Cotswold cross; but I have ever found that, for all practical purposes, the half-bred ewes and the pure Leicester tup paid the most money—producing more weight of mutton and wool as they do, and at the same time a comparatively hardy and docile animal. In keeping up the stock of half-bred ewes, I have been in the habit of buying either half-bred gimmers or lambs from breeders in this county, who breed from the Cheviot ewe and Leicester tup, or have got first class half-bred gimmers from the county of Caithness, where, I think, they will be found better adapted for this county than those bred here. The Caithness sheep are lengthier and stronger, and altogether serve to counteract that tendency to diminish the length of body, size of animal, and closeness of wool, which the light land of this county produces after a few years. The Caithness breeders, from their proximity to the best stocks of Cheviot ewes, and from the stronger nature of their soil, and larger farms, have it more in their power to produce a bigger half-bred sheep than we have. These Caithness gimmers may be bought at an average of from 30s. to 35s., when sixteen months old, or once clipped. In the notes of my calculations, given at the end of this paper, I have not taken

any notice of the yearly purchase price of these gimmers, because the money realised from our drafts will equal that paid for our gimmers, and, as we generally take three crops of lambs from the ewes, it will be seen that one-third of them go off annually, and, of course, one-third forms the new entry. As stated formerly, I have taken a 200-acre farm as my basis, and upon this I shall place a stock of 120 ewes, and propose to follow up their probable produce to market, not, however, estimating the value of that produce at the present high rates for wool and mutton, but what may be looked for over a series of years. I may here state that there generally runs to well-managed flocks in this district about 80 pairs of twins to the 100 ewes, and which would give of lambs a produce of 186 or thereby; and I shall now proceed to give what may be termed a very limited account of the treatment of the ewes and produce, for time will not permit of my going more into detail. I will, therefore, propose that the stock is laid on early in the autumn, consisting of the following numbers, and rated at the following prices, viz.—

120 ewes at 33s.	£198
156 lambs at 20s.	156
Two Leicester tups at £5	10
	£364

Having now got the flock on, the first expense necessarily attending them will be the dipping or bathing, and which may be taken at 1½d. each. The dips I have used are Rawden's and Biggs', and I have found the one equally efficacious as the other in clearing them of all sorts of vermin, and preventing scab; but if scab really exists, more stringent and expensive measures must be used, and the spirit of tar and tobacco juice applied, with unsparing and unremitting attention, till it be eradicated. As a rule, lambs should never be short of meat, and should always be on turnips about the first days of October, and if upon rape and early globes even sooner, so much the better, but this is a matter for the farmer to judge of, although under any circumstances I should never recommend them being later than the time named. And here I would mention, that the kind of turnips I prefer laying them on to are, first, any of the variety of globes, being kept on them till the end of November; then yellows till the end of January, followed by swedes. I have found it desirable to change the kind of turnips. At first they do not consume many turnips, but after a time they gain condition fast, and get well up to stand bad weather in November, and more particularly in December, while, if severe weather should happen to come on during the transition state from grass to turnips, and before they are really well accustomed to the latter, damage may be done to them which they will never recover. A little expense therefore for turnips at that time is well bestowed. In putting them on to turnips in the field, I consider it better to do so by degrees than to force them upon them all at once; that is to say, laying them on for three or four hours daily at first, and then lifting them off to a grass field, lengthening the time each day for a fortnight or three weeks, till they get fairly bit with them, and then allowing them to remain on altogether, although with the choice of a grass field to run back upon if they wish it, and if convenient. I think this more judicious than keeping them in close till they learn to eat turnips from sheer hunger; but, indeed, if lambs have been on turnips with their mothers, it is little learning they require, as they take to them at once—the effect of early tuition. The lambs should get a fresh bit daily, but in giving them this it should never be done unless the morning be very dry, till the sun is well up, and the frost or wet off the leaves, otherwise much loss may ensue from inflammation, the effect of this food in this state on an empty stomach. And in times of severe frost there ought to be a stack of stored turnips on the field, put up in fresh weather. I do not mean that the lambs should be confined to this bit of turnips, but with power to fall back upon their former leavings when they have a mind, and if dry weather, they will pick up the last morsel. Lambs, or rather I ought to say hogs, will do very well in this way till about the middle of January, when, if they are forward in condition, you must begin to slica, and keep slicing till they go to grass about the end of April. This has been my general practice, but I have varied it according to circumstances, and have given them a ½ lb. of rapecake and a ½ lb. of locust beans, bruised and mixed, or a ½ lb. of oilcake and bruised oats daily, either in the field or in house feeding, or in sheds with open yards, and have sold them, after this treat-

ment, quite fat before they were twelve months old, at from 36s. 6d. to 45s. I have used them instead of cattle for making manure in yards, and you cannot do a more profitable thing in sheep feeding, but they require in this case a good deal more attention, and in particular fresh litter daily. If the turnips are a good crop, about 15 acres will do the 186 hogs. On a farm of 200 acres, farmed on a five-course shift, there will be 80 acres first and second year's grass, and 40 acres turnips, and therefore it is necessary, with this limited quantity of keep, to consider how it may be most profitably used. My impression is, that it is better to sell 100 of the best of these hogs of turnips, and to graze the remainder, so as to bring them to an equality before disposal. The grass therefore required would be for the ewes (120), with their lambs, at the rate of three to the acre, 40 acres; and for the 86 hogs at ½ per acre, say 10 acres—leaving 80 acres to out for hay, keep the cows and calves, and the six or seven farm horses. Having now generally stated the management of the hogs, I shall shortly treat of the ewes. I have said that it would be necessary to draught about a third of them each year, and having done so, and replaced them with gimmers or sixteen months' old ewes, being the age at which they are generally entered to the ewe flock, you will give them a run over a bare grass field after weaning time, and keep them sparingly by cleaning up your stables, &c., till near tupping time, when the keep ought to be increased; and if a bit of second foggage or good seeds can be had about the time the tup is put to, you are pretty certain of a good sprinkling of twins. Ewes are proverbially persevering in obtaining their livelihood, and they will pick the last out of everything either in your stable fields or grass fields about to be broken up, and, therefore, instead of costing anything for keep, are really benefitting the land as otherwise, my impression is that there will be sufficient grass on the farm to carry them on till about the middle or end of January before they get turnips; but then it will be necessary to give them a few daily till they come near lambing time, when their feed may be increased. After lambing I find I can make the best lambs by putting the ewes into a new grass field, and give turnips along with the grass for the first fortnight, and then return them to turnips entirely during the day, and into a new or second year's grass field at night. For lambing the 120 ewes, about six acres of good turnips will be necessary, thus leaving from the sheep nineteen acres for the cattle. I may here mention that, during a long and protracted, and perhaps unexpected, snowstorm, I have known a little oilcake bring the ewes through in capital condition, and with no loss either to ewe or lamb; and this may be necessary if your stock of stored turnips gets exhausted. At one time I dared not give my ewes Swedish turnips from the dread of inflammation after lambing, but now I find, from some cause which I cannot account for, unless it be the uniformly higher condition of the ewe, that the swede is about as safe as any other turnip. After the turnips are done, you must not stint the ewes in grass, and new grass if possible, trying to produce the largest flow of milk possible from them, for that is what really makes the lamb. The best time for bringing the lambs in this county seems in most seasons to be from about the 20th March till the middle of April; but if you have plenty of house room you may bring them sooner, and always with the chance of making them better, but in this case it will be well to see that you have a large stack of stored turnips or mangold. The ewes, if in good condition, may be clipped about the first week of June, and the hogs during the latter part of May, or sooner, according to weather and condition. The lambs may be weaned about the end of July, and when weaned must be put on good grass or clover foggage, and, in either case, it is better that no sheep have grazed it for at least ten days beforehand. Having given this necessarily short outline of merely one branch of sheep farming on arable land in this county, I shall now proceed to do, on paper—what is much easier than to do in reality—namely, sum up the probable money proceeds out of the 120 ewes treated as I have very generally and imperfectly detailed, but premising that even this result may not be looked for without considerable care, much attention and judgment, and besides that the 200 acres of land must be really fair land, and in very good condition, giving good crops of turnips and grass; and without all these, and ordinary good fortune besides, the result may not be looked for, although, on the other hand, it is quite possible, by extreme good management, to exceed it. I shall therefore say that, from the 120 ewes there ought to be sold

100 hogs in April, at 35s.	£175	0	0
56 do. in July, clipped, at 32s.	89	12	0
Wool of 120 ewes, 56 hogs, and 2 tups, at			
6s. 6d.	57	17	0
	<u>£322</u>	<u>9</u>	<u>0</u>

But from which deduct—

5 per cent. on original capital for			
deaths and casualties... ..	£18	4	0
Expenses of bathing 278 sheep at			
1½d.	1	14	9
Expenses of shepherd	28	0	0
	<u>47</u>	<u>18</u>	<u>9</u>

£374 10 3

Mr. COLLIE, Ardigay, said there seemed to be no one at his end inclined to make any remarks upon Mr. Geddes' capital essay, but if he could glean their views from hints dropped by one and another, they all seemed to think he had overdrawn the picture, that he would need larger extent of land to produce the results he has arrived at. He (Mr. Collie) did not say that was his opinion, but to carry out the principles Mr. Geddes had laid down in his essay, there are several things that must be taken into account. First, he will require to have his 300 acres of land properly fenced and subdivided. The next thing was, how were they to dispose of the lambs at weaning time? He did not see how they could be disposed of on so small an extent. Then, again, though the prices Mr. Geddes has laid down as being what he is entitled to expect, we are quite willing to allow, though the extent of land he mentions is not sufficient to carry a stock of 120 ewes.

Mr. GEDDES—I think it is quite sufficient, if there are no cattle upon the farm, with the exception of ten cows and ten calves. These calves are sold when twelve months old, in the month of April, so that there is nothing to graze upon the farm but the ten cows. Then upon a farm such as he had described, he presumed there ought not to be a large quantity of hay cut. He thought that they would find that he had not overdrawn the quantity of stock which 200 acres will maintain, if it is fair land, and in good order.

Mr. COLLIE—What would the rent of the land be?

Mr. GEDDES—30s. to 35s. an acre at least. He wished that they might get it at 30s. just now. It must be in good condition too, and enclosed as Mr. Collie says.

Mr. FERGUSON, East Grange, said—On such land as Mr. Geddes has described, I do not think he has over-estimated the quantity of stock it will carry. He assumed the farm of 200 acres to be good, fair land, well sheltered, and well enclosed. Beginning, as he does, with 120 half-bred gimmers, I would put the tup to these gimmers a fortnight or three weeks earlier than is usually the practice, and have them lambed about the first of March. I could then put my fat lambs into the fat market by the end of June. I would then clip my ewes, and have them fat by the month of August, and would thus realise my returns at a much earlier date, and have a larger profit. I make these statements to corroborate what Mr. Geddes says. I think the returns from lambs, wool, and ewes could all be realised in a space of eight and a-half or nine months, and would, at the same time, save grass in August, and afterwards for young cattle coming up; or the ewes might be kept, or another stock of gimmers be laid in to replace them in the month of August.

Mr. STEPHEN, Inobroom, asked how they could make their straw into good dung if they were to keep their sheep in this way. A good dung-yard was certainly the secret of good farming. Sheep farming was good enough in part, but they could never live by it as a whole. If they took land such as Mr. Geddes proposed, it might do well enough the first time it was gone over, but it would not do so well for the next five years.

Mr. CUMMING BRUCE agreed with all that Mr. Geddes had recommended. He had the greatest respect for Mr. Geddes' opinion, but the first thing to be done was to take a leaf out of the Duke of Richmond's book, and enclose their land. The late Duke of Richmond instituted a large and liberal system of enclosing his land. Good judges said it would increase the value of the land 10s. an acre, and he believed it did so. He was sorry to say his own land was to a great extent unenclosed. Until that was done, they could not think of adopting sheep farming to the greatest advantage.

They must look to cattle as their sheet anchor. The price of cattle was very high at the present moment, and cattle required very inferior enclosures to keep them in, as compared with sheep. Although his friend Mr. Brown, Linkwood, frequently told him that sheep left the fleeces behind them, over and above what could be made out of cattle; still he saw that, until the ground was enclosed they could not universally take to a system of sheep farming. He believed they could not, at the present time, make a better use of their inferior grain than to feed their cattle with it. He meant to try that himself—to endeavour to use his inferior grain in feeding, and to buy inferior grain to feed cattle on his farms, which extended to about 400 acres.

Mr. GEDDES—Perhaps I should say I have recommended nothing. I have merely stated what it is possible to do. If any gentlemen found their farms badly situated, or otherwise not suited, for sheep-farming of course they would not go into it. In this paper I have merely endeavoured to show what a 200-acre farm of a particular kind would do, under a particular system of management. It will be for gentlemen to consider for themselves whether I am correct or not, and whether they should change from cattle to sheep. It is quite possible I may be wrong, but all I can say is that I have done it myself over a series of years. Mr. Ferguson has very properly said he would do it in another way, and that he would in that way derive more profit than I would do. Mr. Ferguson has had great experience, and his opinion is valuable. I should be delighted that Mr. Stephen should throw aside those prejudices of his, and introduce the subject of cattle-farming at next meeting, because it is quite clear that, unless we can pay our rents from sheep and cattle, we cannot now-a-days depend upon corn.

Mr. ADAM, Eastertown—How do you mean to consume your straw?

Mr. GEDDES—I have stated that there will be ten cows upon the farm, and ten young cattle to be sold as year-olds in April, and, of course, there would be the horses upon the farm; but if you will refer to my paper, you will find that I said a larger number of cattle can be kept in winter, and recommended the use of a few tons of oilcake or other feeding stuffs.

EX-PROVOST GRANT—I think we are much indebted to Mr. Geddes for the great pains and trouble he has taken in getting up this paper. Whatever difference of opinion there may be, you will, I am sure, admit that he has prepared that essay with great care and great judgment; and he has based it, not on theory, but on actual experience and observation, after bringing to bear upon it as good practical knowledge and talent as any farmer in the county of Moray is capable of bringing. I think, therefore, we owe him our best thanks for that essay, and I think it is likely to lead to important results. He has given us the gross returns that may be realised from a given quantity of land, and I think it will likely be found that sheep farming, at the present day, is most profitable. But still I think there is something wanting which I have no doubt will be supplied at next meeting, and that is a comparison of the profits from 200 acres of land farmed by sheep. Between this and next meeting you can exercise your judgments and ingenuity in endeavouring to bring out how you can turn 200 acres of land to better advantage than Mr. Geddes has done. In the meantime, allow me to move that we record our best thanks to Mr. Geddes for the very interesting paper that he has read.

Mr. GEDDES replied, remarking that he could not enter into all the branches of sheep-farming in this county. Time would not allow him. What he proposed to do was, to give an instance of what could be done upon a 200-acre farm of good land, farming it with sheep, upon a certain principle.

THE PRICE OF WHEAT.—Some old records in Wiltshire state that in the year 1339 wheat in that county sold at eight guinees per quarter, that it continued so for four months, that it soon after declined to 10s. per quarter; that four years after it fell to 4s. 6d. per quarter, and remained at that price with little fluctuation for twenty years; that at the expiration of this term it rose to £5, and held that price till near the year 1534, when it fell to 2s. 6d. per quarter.

THE CULTIVATION OF FLAX.

SIR,—Being a constant reader of your valuable periodical, I have seen many letters and articles on the cultivation and management of flax. As a flax grower, as well as farmer, I send you a few remarks; if you think them worth notice insert them.

In the first place any land on which good malting barley can be grown will produce flax; the best a good loam with a clay subsoil. I believe it may be grown with profit on the same land once in seven years, but not oftener. It is best grown after less wheat, the land being in good condition and clean, followed after flax by stubble turnips, then wheat or barley. The best time to sow the seed is from the middle of March to the middle of April, up to the 1st of May; about nine to eleven pecks per acre, according to the condition of the land. Keep it clean, as it will pay well for it, pulling the weeds out by hand, or cut them with a narrow sharp knife. The time for pulling the flax, about the middle of July—ordinary seasons. When the straw is about three parts of its length yellow, the leaf dead, and the seed bolls striped, take care to lay it straight and even on the ground, as much depends on keeping it straight and even at this stage; turn it occasionally to get it dry and prevent the worms from drawing it into the land. When the seed comes freely out of the bolls when crushed, take it up by hand, and tie it in bundles, and the general way is to place it windward until after harvest. The seed is then stamped out by hand, the bundles or sprouts carefully gathered up and tied; all the loose straws carefully pulled out and put by themselves, otherwise they would entangle the flax whilst spreading.

The next process is the ripening of the flax, or the decomposing the flax straw, sufficient to enable the dresser or stretcher to get the woody portion from the fibre, without materially injuring it. This may be done in many ways; by steeping it in vats with false bottoms, the heat sufficient to produce fermentation, being introduced by steam. This is a quick and economical way of doing it, although at some considerable outlay of capital. Again it may be done by sitting, as described very ably by the Rev. J. Bradshaw, at the agricultural meeting lately held at Belfast; or in the way in which I manage it, and which is generally practised in the West of England. After the stamping, as previously described, it is taken to a pasture or barley stubble where seeds have been sown; it is here spread evenly in rows, care being taken to lay it down of equal thickness. Women and boys are the best to do this. As you can see between the straws, as it may be all wet or dry through at the same time, and consequently ripen regularly, turn with poles; at first every two days, as whilst the oil is in it the worms are fond of drawing it into the earth. Turn it if possible when dry, or only slightly wet, as when wet the poles will injure the fibre: it must be turned at least every week, wet or dry. When the fibre parts freely from the wood, it is fit to take up. Nip a few straws between the finger and thumb; if the wood falls out freely, it is ready to take up. This part of the work is difficult to describe, and the proper way of doing it must be acquired by practice and experience. The time taken on the ground varies considerably with the temperature, &c., and wet, or otherwise; and also the quality of the flax. It may be ready in three weeks, and it may not in two months. When ripe, it must be taken up at once. If wet, placed in small caps, as the air can pass freely through it; if perfectly dry, gather it into shoats or bundles, to be stored for the scutchers or dressers. That put in caps to be taken as soon as dry.

The next process is the dressing or preparing it for market. This is done the most economically at the large flax mills by machinery, by steam or other power; but the farmer has not always these appliances. He may have it done in a shed detached from the farmyard, by the agricultural labourer, first drying it; consuming in the fire the woody portion that comes

from the flax in the course of scutching; then by breaking it by a wooden break, or, what is better, passing it through a machine fitted with grooved rollers, worked by hand. The woody portion when broken comes out freely, by placing it with one hand on the swinging or scutching board, and chopping it with a swingle or scotch; a triangular piece of wood fitted in a handle. This—the manual process—may be found more fully described in Morton's Agricultural Cyclopaedia. When clean it is tied in bundles of twelve pounds each, ready for market.

The total cost in labour, if in a neighbourhood where labourers are tolerably plentiful, is from £6 to £7 per acre.

Such is flax-growing as practised by myself and many more in the West of England; and I consider it worthy of the consideration of any farmer whose land is calculated for it, as we cannot grow corn in the average of seasons at present prices. The price of flax is in advance of corn. Where flax will profitably employ the surplus labour—wanted in the summer months—during the winter, some of the thousands now sent to Russia, Egypt, and other places for the raw material may be kept at home, and be paid to the producer. In our own land it requires a great amount of attention to ensure success; but with attention it pays.

I am, dear sir, yours obediently,

A CONSTANT READER.

SEPTENNIAL AVERAGES.—TITHE COMMUTATION.

SIR,—As many of your readers may feel anxious to know the result of the corn averages for the seven years to Christmas, 1863, published by authority in the *London Gazette* of this evening, viz.:—Wheat, 6s. 3½d.; barley, 4s. 5½d.; oats, 2s. 11½d. per imperial bushel—I beg to state for their information that each £100 of tithe rent charge will, for the year 1864, amount to £103 3s. 10½d. or about 4 per cent. less than last year's value.

The following statement from my "Annual Tithe Commutation Tables" will show the worth of £100 of tithe rent charge for each year since the passing of the Tithe Commutation Act, viz.:—

	£	s.	d.
For the year 1837	98	13	9½
" 1838	97	7	11
" 1839	95	7	9
" 1840	98	15	9½
" 1841	102	12	5½
" 1842	105	8	2½
" 1843	105	12	2½
" 1844	104	3	5½
" 1845	103	17	11½
" 1846	102	17	8½
" 1847	99	18	10½
" 1848	102	1	0
" 1849	100	3	7½
" 1850	98	16	10
" 1851	96	11	4½
" 1852	93	18	11½
" 1853	91	13	5½
" 1854	90	19	5
" 1855	89	15	8½
" 1856	93	18	14
" 1857	99	13	7½
" 1858	105	16	3½
" 1859	108	19	6½
" 1860	110	17	8½
" 1861	112	3	4½
" 1862	109	13	6
" 1863	107	5	2
" 1864	103	3	10½
	£2,880	5	8½

General average for 28 years .. £101 1 7½

I am, Sir, your most obedient servant,

CHARLES M. WILlich,

Actuary to the University Life Assurance Society,
25, Suffolk-street, Pall-mall east, S.W., Jan. 8.

THE HERDS OF GREAT BRITAIN.

CHAPTER XLII.

THE TILLYFOUR HERD.

The pilgrim from Aberdeen to Tillyfour must keep two great directions, positive and negative, in his head—firstly, change your train at Kintore; and secondly, don't get out at Tillyfour station, as scores have done before you. That "i. e." is anything but demonstrative in this case. Cluny Castle, which is said to be the finest granite building in Britain, the woods of Monymusk and Fetternear, with Ben-a-Chie towering behind them, are all pleasant landmarks in the 23 miles; and the fertile vale of Alford just opens upon you, and gives a bright forestage of the Braes of Mar, as you leave the train at Whitehouse. Tillyfour is only three miles from this point; but the outlying farms are more easily reached through Alford. The wind was not in the east, and therefore we were promised a dry day at last, and a really fine sight of the vale, which, save Helon in Tarves, is said to carry bullocks to a greater size than any in the North. Its barley is in especially high favour with brewers and distillers. It suits turnips, both Aberdeen yellows, purple tops, and swedes, remarkably well; but there are no mangels. The farming is high enough, but the climate rather lacks warmth. Stewart's Inn, to which grouse-shooters and tourists resort in the season, and find no "purée of horse beans," but good hare soup awaiting them, was our first halt. The entrance-hall is hung about, not with "pikes and guns and bows," but with enormous fox-skins; and it is some consolation, when one thinks of that terrible sacrifice of good fox-flesh, that the landlord sends South all he can get out alive from the hills, and that ten brace, "with black, four inches up the pad," have been transported to one English county this season. Alford owes much to the cottage architecture of its principal proprietor—Mr. Farquharson, whose mansion, as well as Whitehag and Forbes Castle, is a leading object to the right, with the heather hills (which, even to a Scottish eye, had a peculiarly rich bloom this year), as the glorious back-ground of all.

Still we wanted "hoof and horn" figures in our landscape, and a short ride past the well-filled pastures of Mr. Reid, one of the crack graziers and prize-takers, and the forge of Mr. Sorly—the "Professor Dick"—of the Vale, and so along the banks of the Don (midway between which and the Dee Tillyfour may be said to lie), brought us to Dorrell's, the first of Mr. M'Combie's four farms. It belongs to Sir Charles Forbes, of Newe and Edinglassie, and consists of about 640 acres equally divided between arable and pasture. Ninety beasts were billeted on it, and when we saw them they had been nearly a month off grass, and had kept up their bloom on tares three parts ripe which, given in this state do not induce scouring, and have much finer feeding properties. In fact, green tares make milk rather than beef, and Mr. M'Combie has long abjured them. The first lot were eating their oat-straw and Aberdeen yellows, and the sheddings were judiciously darkened to encourage digestion and repose. They were all threes-and-fours, and "just good commercial beasts," to adopt "Tillyfour's" favourite term, when he is not especially sweet on anything. Not a two-year-old found a place; as their fore-quarters are seldom good, and their tallow supplies are short. The London butchers have been bitten once too often by them. Three-fourths of the ninety were hornless Aberdeenshire, and the rest blacks with white legs, greys,

and reds, brindles, half-bred shorthorns, with poll heads blacks with the loose scur (which is the saving clause of "Doddyism"), blacks with horns pointing one up and the other down, and here and there one with the infallible "mark of the beast" on his buttock, or the real Pagan roan.

The sample grew higher as we went on, and reached the Christmas table candidates for both metropolises, and Liverpool as well. Twenty of them stood in at £23 12s. 6d., twenty-eight at £25 5s., and twenty at £20 10s.—all from Mr. Robert M'Issock's, of Grange Green, near Forres, while a smaller lot of seventeen came from Daudaleath in Morayshire. On we went through the rest—four blacks together, and very difficult to whip apart; two ripe greys; a black grey, pretty nearly the head of the lot; and then, close by a red roan with quite Marmaduke crops, stood a spotted monster of full seventeen hands. Mr. M'Combie drily polished off this Magog as "just a heavy beast for shipping," and he was finally sold by Mr. Gibbons at Liverpool for £52. "That completes the eighty," and then came another lot loose in the sheds, ready to take their place in the double stalls as soon as the Christmas beasts have gone. We had not time to go in search of the bull Champion, as it was long past noon, and a brief November day was not to be trifled with, and so with a glance at the beautifully cross-gartered oat-stacks, which stood in platoons four deep, with William Turner, the bailiff, as chief-architect, we once more sped on our way.

There was nothing to take us to the Castle of Craigie Var, whose strong black loam on the granite has furnished Mr. M'Combie with some of his richest pasturage, and we turned off to the "training" quarters at Bridge End. Its 280 acres are rented by Mr. M'Combie, from his cousin at Easter Skene, and John Benzies, with his blue blouse and Kilmarnock bonnet, is captain of the dépôt. His military decoration is the Dutrone medal, presented to him at Poissy, as the servant longest in command of polled cattle. John is a perfect almanack on the subject of fat shows, which seem to act as milestones on his journey of life. After all his travels by sea and land, he may be said to have lived so much among the shunts and the breakers (of which his master has given such a vivid catalogue in a recent controversy) that it is only wonderful to see him in the flesh at all. The neat-boned Rifleman by Rob Roy, from Pride of Aberdeen, who was first in his class at Battersea, is his peculiar charge; and then came seven dozen bullocks, of which at least seven-and-twenty were "tops," and getting specially sent along upon cake and corn. Three of them, however, were on the reserve-list for next year's shows; or will at least have the benefit of the doubt, when their companions are dispersed by March into many a British larder.

The whole of the shedding is more useful than ornamental, and heather, tiles, slate, wood, and thatch, all play their part in the roofing. It was here that the great Poissy bullock was fed, and John waxed eloquent at the remembrance of him, although neither he nor his master have heard his weight to this hour. Thrice has John crossed the Channel, left six bullocks behind him and brought back £370, a cup, seven gold medals, two great gold medals, and silver and bronze galors. A Tillyfour ox was second for the Cup, on the first occasion, to

the Duke of Beaufort's West Highlander, when the voting was said to be four to four on the jury, and Mons. St. Marie's casting vote to have decided the day. The Poissy ox, *par excellence*, was bred by Mr. Tough, of Destrrie, Aberdeenshire, and sold for £28 at two years old. He was then resold twice; purchased by Mr. McCombie, for £45, from Mr. Shaw, of Bogbairn, kept two years, and finally sold to the Emperor's butcher for £84, after winning £285 in money and cups. Nine eight was his best girth, and he had this peculiarity, that he would never touch corn. His training was not unchequered. After Smithfield, John escorted him, along with the "Birmingham cup" heifer, to Mr. Maydwell's farm in Surrey, and lived with them there till the middle of April. It was not a jovial time, as they brought a Christmas-box along with them in the shape of "foot and mouth," and although the bullock bore up bravely, and only bated an inch, the crack heifer "took off six or seven inches as level as it went on," and had not recovered her bulk when she went to Poissy. Mr. McCombie first saw her at the Dumfries show, and his mind was not at rest till he had given her breeder (the Duke of Buccleuch) a fifty-pound cheque for her, which she returned with interest.

Of the great prize ox of this year, which occupied the box of honour, Mr. McCombie might well observe, prophetically, that "a little man would not be able to see him without assistance;" and in default of a ladder, John adjoined us then and there to mount the manger, and survey (in Athelstaneford phrase) "the vast plateau" of roast beef. "Have you ever looked over more pounds?" was his triumphant query, as we descended. In that low-roofed tabernacle, there seemed but one reply. Still the Islington building quite dwarfed him, and we should not have remarked on him as a veritable Great Eastern among the bullocks there. In his leading points he is rather rougher than some we have seen from Tillyfour; but if he lacks the bloodiness and levelness of the Angus breed, his neck vein is very grand, and, in Benzian phrase, "he is beef to the root of the lug." He cost £48 at two years and three months old, and was bred by Mr. Stephen, of Conglass. His first prize was won at Gerioch; £40 and a gold medal were his two-year-old gurdion at Poissy; and at Liverpool, Aberdeen, and on "the grand tour," he has gathered £180 in all. Still, what with some 2,000 miles of travel on his head, and the keep of eleven dozen weeks at ten shillings, there is no such great margin of profit even after a £80 sale. Still, he had the honour in his death of being bracketed head of the Beef Tripos of the year, with Mr. Heath's gold medal ox. Birmingham and its foundry and factory people have long been a great terror to his faithful John. "They are a terrible lot, with their pinching and poking," he observes; "the gentry are very civil, but this gas it punishes them worst of aught."

Two or three work oxen were being fed off, and laying it on pretty satisfactorily, seeing that flesh has too often a tendency to run to tallow after these furrow gymnastics; but no coaxing could push on the bloodiest black about the place. He is such a beauty that for two years Mr. McCombie has been at him every way, in and out of the house; but his stomach refuses its office, and the tape only tells of eight feet five, and there he sticks month after month. He would have gone to "some side show" this Christmas, but his level, high bred form has melted his owner, and he is going to try him for one more year, and keep him in fact to West Highland years of discretion.

Tillyfour, with its 1,200 acres, of which five-twelfths are arable, and one-sixth old grass, is the property of Mr. McCombie's eldest brother, the Rev. Dr. Charles McCombie. It was here that Mr. McCombie was born in 1805, and learnt that solid experience from his father, which has caused him of late years to be recognized both in Great Britain and on the Continent,

like Jonas Webb in another sphere, as quite a grazier king. His father was equally eminent in his business of a lean cattle dealer. Such was the magnitude of his operations, that one October he pitched 1,500 cattle, Aberdeens and Highlanders, at the Falkirk tryst, and made £8,000 alone out of the 900 Highlanders, which were grazed in Braemar. After his father's death in 1830 Mr. McCombie settled at Tillyfour, and followed, until within the last fifteen years, the lean cattle trade, to which he was bred, besides keeping a few milch cows and grazing several beasts at home. The Vale of Alford Society was his first show ground, and he had not been much more than two years at Tillyfour before he was pleased first with a bull which he had purchased from Morayshire. He won again in 1837, and since then he has gradually fallen into the round of the Vale of Alford, the Royal Northern at Aberdeen, and the Highland Society. Inverness and Aberdeen (twice over) have been his greatest weeks with the latter, as he swept almost everything in his way; and his blacks were "well on the spot" on the only three occasions—Windsor, Carlisle, and Battersea—that there has been an opening for them at the Royal English. He sent fat beasts to the Birmingham and Smithfield Shows as early as 1840, but it was not until 1859 that he and his black brigade became a leading feature. During the last five years he has regularly taken the Smithfield first prize for the polled Scot bullock, besides the first in 1861 for the heifers. The latter not only won the gold medal for him as the best female, but took the cup as the best beast in the yard at Birmingham (where his bullocks' firsts during the same period are only one below Smithfield); and both English and Scotch papers might well unite in their protest, when Mr. Faulkner's shorthorn Dolly, a year older and two inches less in the girth, and by no means a perfect specimen of her kind, was preferred by the Shorthorn, Devon, and Hereford judges to the beautiful "able interloper."

He laid the key-stone of his fortunes as a breeder with the purchase of The Queen from Mr. Fullerton, then of Mains of Ardovy, near Brechin, and now of Mains of Ardestie, near Dundee. She was then a yearling heifer, and cost but £18 at a cheap time. As she turned from her few first services she was put for a penalty to draw wood, and did all the ridging up of thirty acres of turnips as well. She then proved in calf to Monarch (another purchase from Mr. Fullerton after his sale), and the heifer was called after Lola Montes, who was then in the height of her Bavarian conquests. The Queen's first prize was at the Vale of Alford. She was then third at Aberdeen, and even with twelve summers on her head, she was good enough not only to take to the Highland Society at Inverness, but to stand second when she got there to her granddaughter Charlotte, and to beat Windsor (who was third), and fifteen more capital cows. From her and Monarch the family tree branches off in three directions, through their daughters, Lola Montes, Windsor, and Bloomer. Windsor was the dam of Windsor, by Hanton, who was sold to Mr. George Brown, of Waterton, as a calf, and passed over by him to the Earl of Southesk (who was first at Edinburgh with him) for £180. Crosses for the produce of the Lola Montes and Bloomer lines were found in Hanton by Pat, which was purchased at two years old, with a quey from Mr. Bowie for £110, and Angus, by Second Jock, which only cost £26 at Mr. Hugh Watson's roup, and has also done yeoman service to the herd. The latter was put upon both Lola Montes and Bloomer (which, like Windsor, was first at the Highland Society and Windsor Shows), and Charlotte and The Belle, another Highland Society first, but not with the sire of her dam, were the respective results. Hanton, whose show career embraced nine firsts from Alford to Poissy, where even The Emperor could not buy him, got both Pride of

Aberdeen and Daisy from Charlotte, who also had Crinoline by Rob Roy (a son of Hanton); while Fancy was the produce of Hanton and The Belle, and his son Rob Roy followed suit with Lovely. And so the succession has gone on—Monarch, Angus, Hanton, Rob Roy, Black Prince by Rob Roy, and lastly Rifleman, who is by Rob Roy from Pride of Aberdeen—a son and daughter of Hanton—which is as nearly in-and-in as Mr. McCombie dares to go, much as he likes the blood. Kinaird Castle, Balwyhlo, Ardgay, and Monbleton have also furnished their contingents in Empress and Dulcimer, Lady Agnes, Zara, Mayflower, and another Mayflower, &c. Mr. McCombie bought both these "Flowers," after they had stood first and second at Perth, and liked the second prize one decidedly the best of the two.

Scotland is very true to her champions, and when all this thought and energy culminated in the Poissy and Battersea triumphs, four hundred neighbours and breeders, with the late Marquis of Huntley in the chair, assembled to do Mr. McCombie honour by a banquet, which was one of, if not the largest, ever held at Aberdeen. "The English agriculturists always maintained," said the hero of the evening, "that a Scot would never take a first place in a competition with a Shorthorn, a Hereford, and a Devon. I have given them reason for changing their opinion (deafening cheers)." The old champion, Mr. Hugh Watson, was present for the last time in public, and in a few graceful words he tendered his congratulations, and spoke to the glory of the Angus, whose name no time will sever from his own.

"Black and all black," is the password at Tillyfour, and no roans, greys, or brindles, or beasts of any other tints, are allowed within its lines. The fortress lies on the top of a hill, and the steep ascent terminates at last in a little grove of limes and ashes. Behind is the great sky line of the King's forest, bare and bleak, which once was Royal Corranie, and away to the right is the Glen of Tulleyroch, and that evergreen gorse, which knows no Rallywood challenge. The black cock often descends from his heather heights, and shares with about thirty Galloways and Angus yearlings and two-year-olds the outlying hundred acres of the Nether Hill, to whose rich qualities the perpetual burrows of the blind little "gentlemen in black," beloved of the Jacobites, furnish the highest elixir. Don Fernando, of Lord Southesk's breeding, was the field squire of the milch cows, who do the broom business. The good, solid homestead occupies a square within a hundred yards of the house, and the picked beasts for the great Christmas market swell and fill the stall ranges on two sides of it. The crunch and the groan is as sweet music to the soul of Tillyfour, as enveloped in his plaid he takes his rounds, and watches the rich rations wheeled in from the canteen. How he does hate to see the dust collect on their backs, and what arguments on no thriftiness he gathers therefrom! They are "their own turnip slicers," as he holds that half the sap is wasted by the more modern system. The caking, except for the more backward ones, does not begin till within six weeks of the great market, when they get 6lbs. each; but this year with cake at £11 a ton, they have been principally fed on bruised oats and barley. In contradiction to the Mechian and Norfolk theories, Mr. McCombie holds that, as a rule, 14lbs. of cake a day is as much as any beast's stomach can do proper justice to. Except a little white on the forehead of one, and on the belly of the other, all was orthodox, though we forgot to look at the cats, a colour point on which some Angus breeders are equally particular. Only two of the "doddies" had "scurs;" but they were good enough to confirm the butcher's axiom, "never a bad one with a hanging head;" and there was only one out of the forty-three which Mr. McCombie had the smallest notion of "training." Fifty-

nine were away on the Dees side, but we conned the weekly bulletin of them, and wished that half the civil service candidates could send in as smart a *presto* of the week's doings. Two men are in charge here, and the brush and currycomb are not allowed to grow cool in the intervals between the morning and afternoon meals. Only three yearling bullocks were about the place, one of them looking nearly 7 cwt. already, at nineteen months, and another lacking the scale, but very similar in shape to the Poissy ox.

We found the cows with the heifer calves in the pasture close by the house, busy among the new grass left over by the bullocks, to whom they always play second. Foremost among them was the square-made Lovely (by Rob Roy from The Belle), the first heifer at Battersea, and a cup winner at Aberdeen during the time when Mr. McCombie held that trophy for three years in succession. She still retains much of the looks which pulled her through on the day; and Elf of Aberdeen, by Black Prince, was at her side. The Balwyhlo heifer rejoiced in her Jet of Aberdeen. There, too, was the once well-named Beauty, from Mr. Watson's, of Keillor, a fine-sized cow, which fetched 68 gs. at his sale, and she too could boast of a rare Jilt of Aberdeen. This species of nomenclature reached its climax in the calf of Zarah, the second Battersea heifer.

"None half so fragrant, half so fair,
As Kate of Aberdeen,"

says the old song; and Mr. McCombie has taken the hint and named her calf accordingly; and of a truth, one more compact and nearer the ground we have not yet seen in any herd. The dam, which is all going to milk, and has quite sunk her show shapes in the matron, was put in price at 90 gs. to a gentleman at Battersea, but he chose three others at £85 a-head, and Mr. McCombie has his consolation. Zarah was bred by Mr. Collie, of Ardgay, and so was Nourmahal, "the dusty haired cow," the biggest of the bunch, who, like Fancy (the dam of twins) and Daisy, the second at Dumfries, are all descended from The Queen. It is very rarely indeed that any owner can say that he won two first and two second prizes in two classes; but Mr. McCombie has done more, as every one of his Battersea winners has had a live calf, to wit, three heifers and one bull.

Pride of Aberdeen, by Hanton, had a heifer, Scold of Aberdeen, but it was not with her (in consequence of its now-abandoned habit of browsing on its dam's tail), and she formed one of five first-prize Highland Society's winners in the bull-calf meadow. She is better behind the shoulder, but in her thighs and on the top of the tail she is inferior to her dam old Charlotte. Still youth would be served, when Mr. Watson, of Keillor, and Mr. Graham, of The Shawe, two of the finest judges out, of Angus and Galloway stock, judged the pair at Battersea. Charlotte is rising fourteen, and still lacks a whole majority to rival Keillor Grannie. So far she promises well, as there is no patchiness about her, and scarcely any other symptoms of age. Few have been more tried, as she has had foot-and-mouth twice, and lung disease once. Added to this, she had a calf at two years old, and has never missed a year since. They have been principally bulls, and one of them by Black Prince was enjoying nature's bottle at Battersea. She began her long list of winnings as first at Inverness, and the first prize at Paris (of which she still bears the brand on her neck) was the result of her only sea journey. Walker's Mayflower formed No. 3 of this Highland Society quartet, and was purchased by Mr. McCombie for 68 gs. She has a clever calf, Flask of Aberdeen, at her side; while Crinoline, another first as a two-year-old at Inverness, but never after, could boast of a masculine little fellow, Press of Aberdeen. She is a little sparky about the belly, but

wears well, and in this respect is before winner No. 5, the Fair Maid of Perth, by Angus.

Stepping within doors, we found the walls of the dining-room a perfect epitome of French and British triumphs. Mr. Hall Maxwell looked out at us from the post of honour, as he has done in many a Scottish homestead, during our eighteen week's wanderings of these two last summers, and beneath him was the great gold medal of France awarded to Mr. McCombie "*pour l'ensemble de son exposition.*" The academy of Paris, which seems to devote itself, among other things, to the protection of animals "*sans cornes,*" furnishes a written diploma; but if they could have seen the rush when Mr. McCombie half-opened the door of Black Prince's box, they might have felt that their Angus bull sympathies are sometimes misplaced. The hornless are quite competent to take care of themselves. The Albert Cup at Poissy was the centre object of a line of six, which deck the sideboard on high days and holidays. Cups are hard to win; but the trouble which Mr. McCombie had to get seisin of one, when it was won, would form quite an edifying chapter on generalship. The medals have a velvet stand of their own, surmounted by a gold snuff box (the gift of M. Dutroune), and eighteen gold, forty-two silver, and four bronze hang from its dainty tiers. They are, however, only outward types of a far more solid consideration in the shape of nearly £1,400. The first prize taker at the Highland Society is there, dating as far back as 1840, in the shape of a dun (which is equally orthodox with yellow, and brindled, and black) Aberdeenshire horned ox, which was sold for £70, and has as his touching Smithfield epitaph: "*236st. of 8lbs. and 28½st. of fat.*" There, too, in the shape of a black ox from Fair Maid of Perth, is the first-prize winner bred at Tillyfour that ever burst, "not into "that silent sea," but the great Baker Street Babel in the year of grace 1859. It fetched its £70 and weighed 16½ cwt. The Bloomer has her place with a view of Windsor Castle behind her; and so has Victor, taken when he was not in good condition, and Young Charlotte, "who did no good." Old Mr. Maydwell, of the firm of Maydwell and Hoyland (to whom, along with Mr. Giblett, the Tillyfour beasts are consigned) has no reason to regret his proximity to such a glorious specimen as the Buccleuch heifer. "Poissy," with his fine large eye and his ears laid back like a blood horse (no proof of ill-temper, but the contrary in an Angus) is over the side-board, looking like life, with those "bloody jades" Pride of Aberdeen and Charlotte facing him.

Both in point of quality and number of prize "commercial beasts," this was not one of Mr. McCombie's greatest years. He can tie up 300 on the farm at a pinch; and, in fact, he has had as many as 400 (at home) and out on turnips, in hand for market at one time; but this year he did not venture on above fifteen score, and a herd of about fifty—half of them cows and in-calf—made up his home ranks. The heifers are generally put to at two years old, and the calves are dropped as early as possible in the year to suit the Highland Society, which dates from January 1st. It has generally been the Tillyfour practice to have a sale every other year, and the average in '62 was £32 10s. The

calves not kept for the bull trade are never cut before they are a month or six weeks old, and suckled, like the heifer calves, for fully five months.

Hanton and some others of the Tillyfour blood went into Morayshire at beef price, and it is from this county that Mr. McCombie, who buys every beast himself, draws his principal, and, in fact, eight-tenths of his supplies. Forfarshire, Aberdeenshire, and Banffshire are also placed under contribution, but he does not care much for the Caithness and Ross-shire crosses. "Morayshire for sweetness and quality," is a cardinal point of his creed; and he attributes this superiority in a great measure to the quality of their cows, and their county habit of keeping the beasts in the straw yards. He would readily give £1 to 30s. more for a straw yard bullock, as he finds them thrive so much better when they are put to grass. Elgin is his principal market, but the owners send him word, and the great majority of the beasts are bought at their own yards. Only one year has he missed the principal Elgin market, viz., when he accompanied his bullocks to Poissy, and then Forfarshire stood in the breach with forty. Captain Kennedy, of Stranraer, in Wigtonshire, is generally good for a lot of Galloways, and it was from him that he got the black Galloway, which was first at Birmingham and Smithfield in 1860. These heroes of the shaggy frontlet, the odd placed eye, and fan-haired ear are often better in the thigh, and invariably more sluggish feeders than the Anguses; but they will pick up their crumbs royally on the poorest hill land; and this prize winner weighed 14 cwt. clean, and realized £55.

All of the bullocks are tied up by the middle of September, and begin to go to the markets at the end of October, in lots of from seven to sixty weekly, and when the supply is out at the end of March, the market and straw-yard circuits claim their month once more. About 30s. is the average of expenses to London by rail or sea, and last year 39 of the best averaged £38, after all expenses were paid, giving fully £10 a head for nearly eight months' keep. Three-fourths of them go by the steamer from Aberdeen. The Company are their own insurers, and with tide and wind in their favour they go nearly as quickly. In fact, Mr. McCombie prefers even adverse tides and winds to the eternal shunt or at times the dreary wait for the missing manifest when they do get to the journey's end. Still, he has only lost condition so far, and none of his blacks have gone down, as the hapless blood yearling Fandanguero did after the eleventh concussion in the station-yard at York, and fairly yielded up the ghost. They came up sixty-two strong, four and five off, to the great Christmas market this year. Eight more went to Liverpool, and sixty-eight of them sold at all prices from £52 to £36, and the other two for £34. We did not care to sally out six miles in the gloom and the cold of a December morning to take just another look at the London lot, but simply contented ourselves with the private report, that "no other feeder had so many good ones in the ranks," and that they died as of yore, true to their lean flesh charter.

H. H. D.

THE SMITHFIELD CLUB. THE IMPLEMENT SECTION OF THE SHOW.

The implements, as usual, formed a subordinate part of the Smithfield Club Show. They occupied, however, a considerable space, the galleries and the area immediately below them being devoted to such goods. The exhibition was not so large as that of last year. There was to be found less than the usual number of novelties, and but few improvements; while, considering the year, the roots make a splendid appearance.

The first stand beneath the galleries is that of Messrs. WALLIS, HASLAM, and STEEVENS, of Basingstoke, Hampshire. Here is a new drill steerage deserving of attention. It consists of one wheel about 2 feet 6 inches diameter, which, under the guidance of a boy, is completely manageable. The wheel is fixed in a frame, which turns on a centre; the lever by which the boy steers is fixed to it. There are markers extending from each side of the steerage frame, set out the same width as the wheels of the drill, and the boy has only by means of the lever to keep the point of the marker over the wheel track. On the headland it requires no guidance. This is the best steerage we have yet seen; can be attached to any drill for £5. They show good specimens of their field implements and barn machinery. Of the former there are the Excelsior harrows, showing an ingenious arrangement for firing the teeth with few bolts; these are of great strength. Of the latter was shown a Worcester prize combined thrashing and finishing machine, fitted with the patent spherical self-adjusting bearings, for which this firm is so well known. The width of the drum, also a patent, is 3 feet. The patent four-horse power thrashing machine is now to be had for £60. They show the spherical bearings separately, which seem to have gained a good opinion abroad for the evenness with which they work, and their non-liability to heat. We also observed a specimen of Coulson's patent spring hanger, the employment of which in the thrashing machines reduces the bearings and the wear and tear. Every invention which tends to quiet motion must be considered advantageous. Our attention was called to a pretty model of an apparatus for conveying flour, grain, straw, &c., from one warehouse to another across a road, or from any one point to any other point over an intervening space. It consists of two parallel wire ropes, on which run two small carriages with arrangements for attaching a sack or other package, the empty carriage returning by one rope while the full one passes in an opposite direction. It is intended to be worked by steam or by hand.

Messrs. GARRETT AND SON, of Leiston Works, Saxmundham, made, as usual, a good show, excellent workmanship being perceptible in every article. There was one capital specimen of their eight-horse power road traction engine, mounted on improved block springs, which relieve the engine of all jar or vibration while it is travelling, and consequently reduces the wear-and-tear. The smoke-box, cylinder, and funnel bottom are all in a single casting, a capital piece of workmanship. The engine is connected with the driving-wheel by means of an endless chain passing over a chain-wheel keyed fast to the driving-axle. Either of the driving-wheels can be rotated at pleasure, and the steerage is of a simple description. Altogether, the engine is compact, and the general arrangement show that the firm has not in vain endeavoured to provide for a very plainly-expressed want on

the part of the public. They showed a famous twelve-horse power portable engine, and one of the well-known combined thrashing and finishing machines, in which, by a clever arrangement, several blasts are obtained by one and the same fan. The bearings are few, and so externally placed as to be easily reached when the machine is at work. They show one of their excellent seed drills, together with Messrs. J. and F. Howard's steam cultivating apparatus, for which they are agents. This can be worked by their own traction engine.

WM. STEEVENS, Godolphin-road, Hammersmith, London, took his stand beside his steam-plough, which won him honour at Worcester. How the matter will be settled between him and Mr. Fowler seems as yet a little undecided; but he is receiving and executing orders for his implement, which is much liked where it has been worked. It now is shown materially strengthened, and better fitted to deal with the work which put it *hors de combat* at Worcester. His implement, it may be desirable to state, is perfectly parallel, and of equal height from back to front. It consists of two frames, the upper one fixed, and the under one divided into two portions, each being independent. The plough-bodies are fixed to the under frame, and are elevated and depressed by means of a rack and pinion. This rack and pinion renders the entry of the ploughs into the soil perfectly certain, and fixed as to depth. The furrow side of the plough is graduated in inches, so that the ploughman can pitch at pleasure the depth to which he wishes to go. The plough rides on four wheels, three being on the land side. The driving-wheels measure 5 ft. 6 in. in diameter. The total weight is about 18 cwt. The plough is steered by means of a rack and pinion, turned by a wheel, under the command of the ploughman. The price of the four-furrow-plough is £65. He also showed a set of apparatus, consisting of the plough and grubber combined, a well-made ten-horse portable engine, with windlass, and other attendant articles, value £470.

RICHARD HORNSBY AND SONS, of Spittlegate Iron Works, Grantham, made a very large display of very well made agricultural machinery. Of course there was to be found the Worcester prize portable engine and finishing thrashing machine. These bore the name of Lord Palmerston, for at the close of the show they proceed to Broadlands. The latter presents some point worth notice. A patented arrangement has recently been made for cleansing, elevating, and bagging the chaff, by which means this valuable commodity is better cared for. The shaker spindle, instead of being cut off, is carried through, and the elevator pulley attached to the opposite end of it. A very slight demand on the power of the engine thus is made to economise the labour of one attendant, and to preserve the chaff. This firm is anxious to call attention to a new patent swathe-delivery reaping machine, of which we shall be able to form a better idea at Newcastle in July next than now. It certainly looks light and simple, and is said to be the result of fifteen years' study. The machine is pulled into the crop with two horses. The wheels are two in number—a driving wheel, 2 feet 6 inches diameter, and a carrying wheel on the other side, beneath the platform, about 6 inches wide, and quite out of the way of the standing corn. The platform is rigid, and rises somewhat obliquely from the knife bar. It is traversed, like Cross-

kill's Bell's machine, by patent steel fork delivery chains, which may be considered a great improvement upon the webs. Throughout the machine steel chains are driven by notched pinions, in place of bands. The height of cut is regulated by a toothed quadrant and worm, from 2 to 12 inches. The driving-wheel, 2½ feet in diameter, makes one revolution to 12½ of the crank; the throw of the knife is 4½ inches, and the weight of the whole is about 8½ cwt. The gearing seems simple, and the parts simply and effectively arranged. The driver appears to have power to throw all the machinery out of gear by a movement of his foot. The price is £32. This firm is coming out as manufacturers of a series of these harvesting and grass-cutting implements, both simple and combined. There are also the well-known champion ploughs of all sizes, and the new turnip-cutters and pulpars, the latter being highly spoken of by the Royal Society's judges in the following terms: "It will commend itself to the farmer by the character of its knives, or rather grinders, which are easily drawn (being stopped with wooden pegs), easily sharpened and reset, cheap, and durable. Would that man's dentition was as effectual and accommodating." There was a good assortment also of drills, dressing machines, and washing, wringing, and mangling machines.

WILLIAM TASKEE AND SONS, of Andover, Hampshire, considering the distance from home, made a very fair show with a combined finishing thrashing machine; a winnowing machine: a corn and seed drill; a two-horse power thrashing machine; the patent windlass, with most ingenious sun-and-planet motion, to be used with any steam cultivating apparatus (£75). It does not necessitate the stoppage of the engine when the course of the plough is reversed. They showed also some very good ploughs and harrows.

AYLING AND PORTER, of Rochester, Kent, showed only their traction engine, in two sizes, eight and ten-horse power. This capital engine has now made an established reputation, not only at home but abroad. Having taken several medals at various European exhibitions, it is no uncommon object in Holland and Prussia and France. Two have just proceeded to Russia, to be used in the Government dock-yards; two are in Egypt, driving Howard's steam cultivating apparatus; three are in Java, employed in the removal of produce; and three are in Australia, carrying copper ore for the Copper Mining Company. These engine are adapted for the carriage of heavy materials, for the pumping of water, for the cultivation of lands, for driving, sawing, and other machinery. One of these engines, built this autumn for Richard Hartmann, the eminent locomotive engineer of Chemnitz, Saxony, was tried at Rochester before departure, when it drew 26½ tons in addition to its own weight up a long incline of 1 in 12. The cost price of the eight-horse power engine is £360, and a strong waggon, capable of carrying 7 tons, on wood wheels, costs £60. The engine has two speeds—the slow one, of two miles an hour, for bad roads or field work; the other, of four miles an hour, for good roads.

TUXFORD & SONS, Boston, Lincolnshire, showed a specimen of one of those superior portable steam engines, with horizontal cylinder and tubular boiler, which so surprised us all at Worcester, by running 8 hours 53½ minutes with 1 cwt. of coal, working up to its full power all the time: it was the 10-horse power double cylinder, price £385. There were two of smaller power, one of which was a 2-horse power, together with an Appold's centrifugal pump, capable of performing double the duty of the old scoop wheel, in raising water for drainage or other purposes; a circular 30-inch saw bench, and a 2-foot stone grinding mill. This firm is engaged in very extensive transactions abroad, in respect of their

traction engine; and we understand that they have brought out a new windlass for steam cultivation, in which frictional gearing is employed for avoiding breakages of the wire-ropes, the breaks being self-acting. The Worcester prize finishing thrashing machine was not shown.

JOHN FOWLER, Steam Plough Works, Leeds, showed one 14-horse power double cylinder steam ploughing engine, one engine of 10-horse power, one four-furrow plough, and a seven-tined cultivator. There are no improvements to notice in this apparatus, but the crowd that buzzed round it during the show spoke of the interest excited by its performance. The tackle has won golden opinions abroad, and is now to be found developing the resources of Austria, Hungary, Prussia, France, Russia, and the Principalities. At immense expense they are transported to India to prepare the land for cotton, tea, coffee, and indigo; the sacred beasts and birds of the Nile are contemplating the four-furrow plough, and not a little trying to the prejudices of the population must be the stride expected of opinion, from the old-world parent plough, which slid along in the dust of the surface, refusing to grapple with the soil, to this perfected invention of modern times. Our colonies are becoming acquainted with the value of steam-ploughing apparatus, especially those where the climate is detrimental to horses and cattle. When the new works are completed, one engine will be turned out daily. The space now allows only the construction of four engines weekly. This shows a rapid increase since 1851, at which date the inventor had scarcely conceived a notion of his steam-drainage plough, which was the parent of the present apparatus. His catalogue now contains testimonials from no less than 101 men who seem to be satisfied with the effects produced by the apparatus.

A. and E. CROSSKILL, Beverley, Yorkshira, show as usual their clod-crusher, which is now being used as an adjunct to the steam-cultivating apparatus; also a specimen of a strong one-horse cart, to carry 80 cwt., fitted with harvest-shavings (£14), wheels and axles of excellent manufacture; a well-made pair-horse waggon; a simple 120 gallon liquid-manure cart (£17); the Archæmedian-screw root-washer; and a model of the portable railway now much used where wood is cheap, the necessary angle-iron, trucks, and turntables only being supplied. The price, to carry 15 cwt., 2 feet 6 inch gauge, is 4s. per running yard, wood and iron together. There was the patent Victoria sheaf-delivering reaper, improved and manufactured by this firm, and a selection of pig-troughs.

CLAYTON, SHUTTLEWORTH, AND Co., Lincoln, made a large display; one of the most conspicuous objects was one of a number of 14-horse power traction engines lately ordered by the Egyptian Government, to be used in steam-cultivation. This is but one branch of an immense trade carried on abroad by this firm, who say that they last year sent 120 steam-engines and thrashing-machines to their agency in Vienna, and that a large trade is springing up in Italy and Germany. The engines exhibited were of all powers, together with fixed engines, of splendid workmanship, and combined thrashing and finishing machines, with the same qualifications; saw-benches, corn-mills, and flour-dressing machines. The traction engine does the firm great credit; in detail it is perfect, and notwithstanding its size the proportions are good. A shelter is raised over the engine-man.

WILLIAM BALL, Rothwell, Kettering, had a great display of the ploughs so well known at the various ploughing matches in the shires, together with a well-made two-horse waggon (£80), two carts, and a scarifier.

JAMES and FREDERICK HOWARD, of Britannia Iron Works, Bedford, exhibited a set of their steam cultivating apparatus, with 1,600 yards of steel rope and ten-horse power self-propelling engine, price £670. This apparatus, on referring to the list of testimonials, has broken ground in Bedfordshire, Berkshire, Buckinghamshire, Cambridgehire, Dorset, Essex, Gloucestershire, Hampshire, Herefordshire, Huntingdonshire, Kent, Lancashire, Leicestershire, Lincolnshire, Monmouthshire, Norfolk, Northamptonshire, Notts, Oxfordshire, Shropshire, Suffolk, Surrey, Sussex, Warwickshire, Wiltshire, Worcestershire, Yorkshire, Scotland, and Ireland. The character of these testimonials is highly satisfactory. Like the rest of their brethren they are supplying the European and colonial demand which arises, not merely for their steam apparatus, but for the ploughs and harrows upon which they founded their reputation as a great manufacturing firm, before steam came to be an acknowledged power in the field. We were pointed to a new and apparently very excellent ridging frame, which is designed to supersede the ordinary tine in the cultivator. It has been proved to throw up the land in bouts, and to subsoil the land at the same time in first-rate style. Two reversible wings are hinged, as it were, vertically to the tine, their lower line just working over the broad share. These wings consist of three thick ribs, something like the potato spreader, although much of the mould which comes against them to pass through. The plough has undergone a few simple changes: it is now placed on four wheels, which renders the steering easier, and steadies it in work. They show also a very excellent horse rake marked XX, in which a patent leverage is used, by which the teeth when in work are raised from the central axle, and are thus left free to adapt themselves to the irregularities of the surface. The front part of the rake on which the teeth are suspended is held in position at the same time by a self-acting movement of the lever. They also have made a great improvement on the chain harrow, by constructing the links of a tripod shape, with case-hardened points on each side. It can be worked either side upwards, and backwards or forwards.

W. S. UNDERHILL, St. Mary's Works, Newport, Salop, exhibited the new patent blast elevator, one of the most important inventions recently made in thrashing machines. He says that he has now supplied 2,000. It is a happy thing when a man makes so decided a hit, and introduces an improvement to a necessary machine, which can be applied at but small expense. He had a six-horse power double-blast thrashing machine, which has only 16 bearings and two straps; a few land implements; Phillips's drill for sowing seed in gaps missed or taken by fly, &c. (8s.); models of hand 75-gallon carts for liquids or solids; a convenient little stove on wheels, with coalbox behind; and a series of cattle and sheep troughs of galvanized iron, the latter being on wheels, 8 feet long, 12 inches wide and 8 deep, with wire framework over (17s.).

HOLMES and SONS, Prospect Place Works, Norwich, showed nothing specially new, but good specimens of the drills and manure distributors for large and small occupations, to which so many prizes have now been awarded by the Royal Society, the county societies, and at the various continental international exhibitions. They also showed their prize 8-horse power portable steam-engine, the prize combined thrashing and finishing machine (£120), a very perfect well-made machine, and the clover seed thrasher and sheller.

THE PROPRIETORS OF THE BEVERLEY IRON WORKS, Beverley, Yorkshire: This important firm, formerly known as Wm. Crosskill, then as Crosskill's Trustees, and now by the above distinction, make as usual a large display of the specialities of their manufacture. The wheels and axles are of excellent workmanship; so also are the

carts and waggons, now so much used. The Leeds prize 8-horse reaper, so well adapted to furrowless large fields, as they all will be when steam cultivation is a few years older, was visible and unaltered. There were specimens of clod crushers, of Torr's pig troughs, and of a simple liquid manure cart, capable of holding 190 gallons (£17), fitted with a simple brass outlet valve and lever, so arranged that a man can open and shut it as he walks by the side of the horse. A trough with four flexible tubes can be substituted for the spread board, if it is desired to water in rows instead of broadcast. This cart has won golden opinions. The portable farm railway (4s. the running yard), with light tipping waggons, is an object of attraction and purchase to many, so convenient is it for conveying manure, marl, lime, roots, and earth, over wet land. It is made in 16 foot lengths, 2 feet 6 in. gage, each length consisting of two longitudinal sleepers, which are edged with angle iron, and are connected by transverse sleepers, in such a manner that they can be folded like a parallel ruler when taken up. The bone crusher of all sizes must not be omitted from this category.

RANSOMES and SIMS, Ipswich, Suffolk, show their strength in all directions, from an 8-horse power steam engine to a cake breaker, their manufactures being generally characterised by simplicity of construction, ease of repair, excellence of workmanship and material, and, considering the combination of these qualities, of cheapness. No firm, we believe, was earlier in the field, or has done more to promote that age of progress in which we now rejoice. Their ploughs still maintain a very high position; in harrows they have recently introduced some improvements. They showed a set of what are termed "*solid frame harrows*," the frame being wrought iron riveted together, and not connected by the fastenings of the teeth. The teeth are independent, of plain square iron, equally strong throughout, and without a shoulder. They are fastened to the frame by clips and screws, in a way which renders them perfectly rigid, and their length can be regulated at pleasure. We discovered also a new *patent jointed harrow*, in which the teeth are attached to a jointed frame, which allows them with the greatest facility to follow the irregularities of the soil. There were several root cutters, chaff cutters, corn and cake crushers, combined and universal mills of excellent make, and the A 1 steam thrashing and finishing machine, containing the patent adjustable rotary wire corn screen, which forms a most admirable finisher. The 8-horse portable engine possesses a few improvements worthy of mention. The forecarriage supports the boiler on a ball-and-socket joint, which prevents much strain over rough roads; the governors are very simple, taking effective and direct hold of the throttle-valve; and two tie-rods are introduced between the cylinder and the brackets, which tend to relieve the fly-wheel brackets of much strain. The Victoria reaper was not exhibited.

WOODS and COCKSEGE, Suffolk Iron Works, Stowmarket, showed a judicious selection of their food-preparing machines, attention being specially directed to the Gardner's turnip-cutter, improved by the strong iron frame which overlaps the wood frame and prevents it from being rotted by damp. They showed also one of their celebrated prize portable corn-grinding mills, fitted with London-built French burr stones, fixed in strong iron frames. The mode in which these stones can be instantly set for wheat or barley is very simple. The specimens of barn machinery comprised thrashing and dressing machines combined, two-horse thrashers, weighing machines. The field and road implements comprised for the most part carts of good build, and extirpators; and we observed a sample of the excellent horse gear sent out by this firm for driving their chaff engine, prize root-mincer, and

roller crushing mill. The shafting lies level with the ground, and the intermediate motion, entirely iron, is fitted with a clutch to throw in and out of gear without stopping the horses or the steam-engine.

E. R. AND F. TURNER, St. Peters Iron Works, Ipswich: This firm showed one of the portable engines for which they have obtained great distinction. A combined thrashing machines fitted with Bobby's screen as a finisher (£85); one of the capital corn-crushers, 10,000 of which have now been supplied to their customers; Dr. Agger's digging machine, which they are endeavouring to push into notoriety; and Mr. Collinson Hall's model of his mode of steam cultivation. Mr. Hall was there to explain his own machinery, and created a considerable amount of sensation amongst those who are looking out for improved moles. He has now made a decided advance, and finds himself able to employ 2 engines of small power, combining their force to exert one continued pull upon the implement worked. This is done by means of sectional polygonal drums which surround the boilers of the engines and the solid steel link chain rope. The links exactly fit the sides of the polygon, and each side contains a projecting tongue into which the link fits. The engines are placed on opposite headlands like Savory's, and being worked together, they unite in their efforts to drag the plough or cultivator backwards and forwards. In this case the engines are both locomotive, of course; but Mr. Hall has made an endeavour to adapt his system to the ordinary portable farm engines of the day. We would not advise him to bestow much attention on this arrangement however, but to give his undivided attention to the perfection of the first arrangement, which yet abounds with many difficulties of detail. This has been tried by Mr. Hall upon his own farm, and found to work very well, and as we hope to give a report of it from Princes Gate Farm, we will let this notice now suffice.

T. W. ASHBY & Co., Stamford, for many years manufacturers of first-class agricultural machinery, are still at their stand. Their new patent haymaker, possessing all the advantages of the original haymakers, which may be called the parent of haymakers, has been much simplified. The main axle is now solid, and carries external shifting apparatus, which can easily be got at by the workman. The machine is strengthened, and the gearing is so arranged that the revolving forks are instantaneously reversed by the driver, without his being obliged to leave the horse. It is stated that two thousand of the old machines have been sent out, and a large number of these have gone abroad. They show a series of their well-known chaffcutters, cake mills, a four-horse power portable steam-engine—a much approved machine—with combined thrasher and combined four-horse power portable grinding mill, £35. The rotating harrows are exhibited, and the service they have rendered to the many purchasers has elicited a quantity of testimonials contained in the catalogue. Where they work at all, there is reason to expect them to work well. The teeth of the ordinary harrow working parallel with the lines of the furrow slices leave those lively furrow-slices too frequently in their integrity even after passing over them three or four times. The heavy-land farmer wishes only that he could cross the land; once would cover the seed, but he dare not. The horses must be kept in the furrow; and here is the means by which, the horses walking in the furrows, the harrows may still work at right-angles to the furrows, which are thoroughly broken up before and after the drill. Drawn by steam they are doubly effective, for the increased pace gives the quicker rotary motion.

EDWARD HUMPHRIES, Pershore, Worcestershire, shows only the combined thrashing machine, which prepares grain, and finishes it for market in first-rate style.

BARRETT, EXALL, AND ANDREWES, Katesgrove Iron Works, Reading: This firm, which has now attained a European reputation for splendid engine and mill work, show fine specimens of their seven and three-horse power portable engines, and their six-horse power fixed engine; also a combined thrashing machine, a saw-bench, a hay machine, a horse-rake, together with a series of chaffcutters, and grain mills. There is an extensive demand for the "safety horse works," which have won prizes and medals, and honourable distinction, in every part of Europe and America. They are used without the necessity for an intermediate motion. The horses walking round three times a minute, causes the lay shaft to revolve 100 times in the same time; and the works are completely boxed so as to be out of the way of doing or receiving injury.

THOMAS B. ATSFORD, Waltham Green, London, excited much attention by an exceedingly well made cheap and dashing farmer's cart, which is fitted either to convey himself and family, or pigs, calves, poultry, &c., to market. It is well hung on three springs, the body is well framed with ash, the pillars at the corners are secured with iron, the axle is Collinge's, the shafts are of lancewood; there is a raised stuffed back and cushions, with patent leather dash and wings, and plated silver lamps. It is a capital thing.

BROWN & MAY, North Wilts Foundry, Devizes, showed good specimens of their 8-horse power portable steam engine, highly commended at Worcester, and an improved road locomotive traction engine, adapted to drive ploughing, thrashing, sawing, and other machinery. In the engine the cylinder is placed at the front end of the boiler, and is steam-jacketed; the exhaust steam is not allowed to rob the boiler of heat by passing through it, but is made to enter the funnel direct. It can be driven at two speeds—two and four miles an hour. At the latter speed the eight-horse-power traction-engine will draw twenty-five tons on the level road. The power is communicated to the driving-wheels by means of an endless pitch-chain, and both wheels can be moved at pleasure. The tender, fixed behind the fire-box, will carry water and fuel for an eight or a ten mile journey. They did not exhibit the windlass used to work Smith's implements, for which they are agents. The new crushing-mill, of great power, is more for commercial than agricultural purposes, and is used by those who deal in ores and coprolites.

MARSHALL, SONS, AND Co. (Limited), Britannia Iron Works Gainsborough, Lincolnshire, showed several well-made steam-engines, portable and fixed, and a good circular-saw bench.

PHILIP AND HENRY PHILIP GIBBONS, Wantage, Berks, had a combined thrashing machine, to finish for market, well-constructed and cheap.

GEORGE RYDER AND CO., Church-gate Engine Works, Leicester, exhibited a 4-horse portable steam-engine, noticeable for a rather novel mode of superheating steam with economy of fuel, and a haymaker which awaits the Newcastle trial.

F. H. WENHAM, 1, Union Road, Clapham Road, London, brought a specimen of an improved engine, called by him a "Patent compound portable steam engine." In this engine the steam is led direct from the boiler to the small cylinder at the front end of the boiler, the exhaust steam from which is conveyed by a pipe, downward through the heating chamber, placed in the smoke box at the end of the boiler, and having tubes coincident therewith, so that both may be swept out together. The steam is much increased in volume by this heater, which can be easily removed at will, and from thence enters the large cylinder on the opposite side of the funnel, through a pipe,

and is finally exhausted through the chimney by the jet. It is said that engines constructed on this pattern, with a boiler pressure of 100lbs., consume only 2lbs. of coal per indicated horse-power per hour. Although we have not seen this engine at work, we notice so important a statement, in order that those who are wishing to economise fuel may at once make their own inquiries.

BARROWS AND CARMICHAEL, Banbury, Oxen, showed a simple, effective, well-made, and cheap portable steam engine of ten-horse power, as a sample of their wares.

THE GALLERIES.

JOHN ALLIN WILLIAMS, Baydon, Hungerford, Wilts, brought a number of implements adapted for steam cultivation, which have been tried on his own farm. They consisted of a cultivator, a set of three-ridge ploughs for the cultivator frame, a level hand-presser, and some models. There is much in them worthy of attention.

JAMES COULTAS, JUN., Spittlegate, Grantham, showed two prize twelve-row corn drills, a five-row turnip drill, a prize liquid manure drill, and a fore-carriage drill steerage, all of undeniably good workmanship.

A. B. CHILDS AND CO., 481, New Oxford-street, London, showed a series of American inventions, for which he seems to be the agent in this country. They are all of them labour-saving machines, and are mostly characterised by great simplicity of construction and inexpensiveness. Such is Redstone's patent sowing machine, Sweet's American churn, Cahoon's patent American broadcast seed-sower, a patent American post-hole auger, Hagley's patent self-adjusting wringing machine, and Child's patent washing machine. One of the best of all, however, is English. Many well remember Gittus and Leggett's patent non-parallel chaff-cutting machine, which excited universal admiration at Worcester. This was on the stand, and seems likely to have a good run.

HOWARTH AND CO., 20, Keppel-street, Russell Square, showed two well-made cheap carts, constructed of Scotch varnished elm.

THOMAS GIBBS & CO., Corner of Half Moon-Street, Piccadilly, as usual made a good display of roots, consisting of long red mangel wurtzels of 18 or 20 lbs. weight, from Lord Darnley's farm; of yellow globe, from a crop weighing 58 tons to the acre, from the Royal Farm at Windsor; of kohlrabi; of the hardy greystone turnips (21 lbs.), from Lord Darnley; of green rounds, from Sir T. Throckmorton's; of green top yellows for late feed, a beautiful variety with small neck. The new mangel does well, and gains ground. There were good collections of dried specimens of permanent grasses, of English wheat, barley, oats in ear; of grass seeds, and seeds of all kinds.

JOHN REYNOLDS, 57, New Compton-street, Soho, London, showed some really capital espalier wire fencing, which is light and excessively ornamental, together with a little wire protection to throw over a row of newly-sown garden seeds, to protect them from birds.

BRIDGEWATER PAGE, Southampton, showed a good selection of roots and seeds, but his stand was a source of great attraction by reason of a large selection of "Blundell's Cattle Melon," which has now been cultivated in the field, and proved to be a good cattle food. It is calculated to fill the vacuum during the months of August, September, and October, before the ordinary root crops are fit. Mr. Blundell, it appears, prepares his land as for mangels, manuring heavily; sows in the middle of May. The crop, removed on the 28th September, weighed 40 tons per acre. A part of the field, treated in a similar way, and sown with Orange Globe Mangels, yielded but 22 tons per acre, the expense of culture being the same in

both cases. The melon grows to an immense size, five or six fruit springing from one seed. The crop exhausts the land less than the turnip crop, and derives most of its support from the atmosphere; and the analysis made by Dr. Voelcker presents an evidence of its fine feeding properties. Packets of fifty seeds are sold for 2s. 6d. Mr. Page's roots were very good—Long Red Mangels 2 feet 6 inches long, Improved Purple Tankard Turnip for early feed 18 inches by 7, Grey Stone Turnip 10 inches in diameter.

FREDERICK EDGINGTON AND CO., Old Kent-road, London, showed a variety of waterproof waggon and cart-covers, hemp halters, sacks, waterproof loin-cloths, and selections of horsecloths, together with a keg of approved cart-grease.

GEORGE GIBBS AND CO., 26, Down-street, Piccadilly, made a very attractive show, as usual, of roots and seeds of all descriptions. They call particular attention to the Ashcroft Swede, a large keeping turnip, with a fine top, of which good specimens were shown. From Mr. Drewitt's farm at Guildford were shown Yellow Globes of 32lbs. weight; from Mr. Robinson's, of Derby, Drum-head Cabbages (the largest exhibited) of 46lbs. weight; and fine Green-top and Purple-top Hybrid Turnips from Chichester. Lord Lonsdale had sent some fine Kohl Rabi, Mr. Drewitt some magnificent Long Red Mangels, Col. Ames some of Watson's Purple-top Swedes, well grown. The Potatoes were fine, one large Regent weighing nearly 3lbs. The stand was beautifully decorated at top with arches of barley-ears hanging from their plaited straw, beneath a pretty border of waxen variegated holly leaves.

JOHN EDGINGTON AND CO., 48, Long-lane, Smithfield, showed models of rick-cloths, specimens of sack-twines, thatching cord, cordage for all sorts of purposes, sacks, and improved waggon and machine-covers.

J. C. WHEELER AND SON, Gloucester, showed a good stand of roots and seeds.

DRIFFIELD AND EAST RIDING PURE LINSEED CAKE COMPANY (Limited), Driffield, Yorkshire, showed a stock of sweet-smelling cake.

RAYNBIRD, CALDECOTT, AND BAWTREE, Basingstoke, Hants, showed a good selection of roots, comprising Long Red Mangels, weighing 16lbs.; Long Yellows, 22lbs.; fine Globes; a new hardy White Swede, guaranteed to stand frost; and the case which was at the International is filled with samples of wheat and barley, beautifully arranged.

GEORGE WHITWORTH AND CO., Jamaica-row, Bermondsey, showed their highly-concentrated fish manure.

GEORGE TURNER, Rose-terrace, Brompton, London, shows mincing and chopping machines, case of horticultural implements, weighing machines, pumps, and cast-iron ware for garden purposes.

JOHN MILTON JONES, 21, Westgate-street, Gloucester, showed a composition for waterproofing leather, and a specimen against foot-root in sheep.

FREDERICK BAYNHAM, 66, Lant-street, Southwark, exhibited samples of Indian pig-meal, and granulated oil-cake.

F. M'NEIL AND CO., Asphalted Roofing Felt Works, Bunhill-row, London, exhibited good specimens of their manufacture, which has been well tested by those who have the charge of Government works.

PHILIP JOHNSTON, 290, Oxford-street, London, made a large show of dairy apparatus, principally consisting of a series of the wooden box-churns, beginning with the smallest, to make 1lb. of butter, to one capable of making 25lb., all cheap and efficient.

CHARLES POMEROY BRITTON, 27, Leadenhall-street,

London, showed, within a glass case, the action of the "hydropult," a portable fire and garden engine, with suction and delivery hose. Worked by one man, it is said to throw 8 gallons of water per minute 50 feet.

EMERSON ARCHER, 1, Davies-street, Oxford-street, exhibited good dairy apparatus, together with washing machines, &c.

J. S. ANGEL, 162, Fleet-street, London, showed a good selection of agricultural and horticultural books.

WILLIAM ALWAY, 37, Chapel-street, Pentonville, made a very glittering show of all sorts of dairy apparatus in black-tin and brass, of most excellent make and quality, and very reasonable in price.

JAMES BARTON, 370, Oxford-street, showed three sets of stable iron stalls, in three divisions, with a quantity of beautiful, convenient, and sanitary fittings, much used in the present day.

BURY AND POLLARD, Park Iron Works, 17, New Park-street, Southwark, showed their capital self-regulating wind engine, for driving agricultural machinery in barns. This simple mode, in which wind is made available as a motive power in the farmyard, is likely to bring wind, which was coming to be disregarded as a source of power, again into fashion. Next to water, wind is the cheapest power. Its inconstancy is against it, and would render its sole employment on very large farms a doubtful measure; but for small farms it is just the thing. The machinery needed is most simple; and, with the necessary power, thrashing, corn-grinding, chaff-cutting, pulping, and water-pumping can all proceed under one roof, above which the revolving mill-sails may rustle and whistle and creak in the stiff breeze. We have the greatest pleasure in calling attention to this most useful invention.

MONS. M. CONAIRD, New-road, Shepherd's Bush, Hammersmith, showed his ingenious machine for clipping horses and cattle, on which we commented at length last year.

CROGGON AND Co., 2, Dowgate-hill, London, showed a model of a building roofed with felt, a quantity of asphalt roofing, together with galvanized iron troughs, roofs, and gutters.

JAMES DUFFIELD, 77, Regent-street, showed a large stock of dairy apparatus, butter moulds, and pretty bread-and-butter dishes for the table.

JAMES MATTHEWS, 41, Wellington-street, Strand, W.C., exhibited a selection of agricultural publications that do credit both to writers and readers.

FRANCIS MORTON AND Co., Engineers and Contractors, 27, James-street, Liverpool, exhibited various models, in galvanized corrugated iron, of roofing plates, farm sheds, ornamental shooting lodges, and of strained cable fencing, now much used here and in the colonies.

A. DAVIS, 83, Strand, showed specimens of well-made harness.

S. AND E. RANSOME AND Co., Essex-street, Strand, showed a series of Hale's patent mincing and sausage machines; Colins Pullinger's mousetraps, automaton and perpetual; Wilnot's patent handtruck, the wheels of which are immediately locked when the foot is placed upon the bar, as it always is when the employer of it is about to receive the load. This is a capital contrivance; and the locking gear can easily be attached to trucks already in use.

BARRY BROTHERS, Meriton's Wharf, London, S.E., showed casks of "Long's Specific," a non-poisonous sheep-dressing; "Long's Foot-rot Lotion," in cases; &c.

WILLIAM CULLINGFORD, Wellington-road, Forest-lane, Stratford, Essex, exhibited various articles exemplifying the useful nature of hemp and cocoa-nut fibre, employed for harness, fencing, &c.

THOMAS GREEN AND SON, Victoria-street, Holborn-hill, showed several of their well-approved prize lawn-mowers and garden-rollers; and a vertical engine and boiler, built to occupy positions too cramped for engines and boilers of other forms. The foundation plate being used as a feed water tank, in which the water is heated before passing into the boiler, and also as an ashpit, no brickwork or foundation is required.

STEPHEN HOLMAN, 18, Cannon-street, besides the well-known hydraulic pump and hydraulic lifting jacks, attracted much attention by working a "hydraulic punching lever, which will cut a $\frac{3}{4}$ -inch hole in the most perfect manner through a $\frac{3}{4}$ -inch iron bar, the man's arm lifting a lever up and down a few times, being the simple motive power.

JAMES RAWLINGS, 10, Carlton-street East, showed a sack-holder of somewhat new construction.

WELBURN WILLIAMSON, 183, High Holborn, exhibited a series of washing, wringing, and mangling machines.

SAMUEL LEAKE WORTH, 298, Oxford-street, London, showed a number of miscellaneous fancy articles suitable to the stable, the kitchen, the garden, and the table.

JAMES CARTER AND Co., 237, High Holborn, London, made a very good show indeed of roots. We were particularly struck with his varieties of the Imperial Purple Top Swede, Elvethan Long Red Mangel, Orange Globe Mangel (of prodigious size), "Jersey Navet" (an early sort), Orange Globe Turnip, and Grey Stone. There were beautiful specimens of American Pampas grass, now used as an ornament for lawns, the flowers, when dyed of various hues, forming pretty ornaments for the room or hall. There were specimens of Jersey kale, ten feet in height; a beautiful case of wheat, oats, and barley in ear; two samples of garden seeds; and at each end of the stand a specimen of the *Phormium tenax*, or New Zealand flax, which is used, like cocoa-nut fibre, for coarse webs and ropes, &c.

BENJAMIN EDGINGTON, 2, Duke-street, London-bridge, Southwark, made a large display of well-constructed cheap canvas cloth for various purposes, hemp sheep netting, and models of marquees for agricultural shows.

WILLIAM SKIRVING, 15, Queen-square, Liverpool, as usual, showed a stand of the swede which takes his name, some of the roots being 9 and 11 inches in diameter: they were singularly sound and sweet. Also some pink eye fluke potatoes, a new selected variety, which will keep sweet two years.

JOSHUA COOCH, Harlestone, Northampton, various of his well-known prize dressing machines and seed cleaners. The improved corn and seed dressing machine won the first prize awarded to this description of machine at Worcester, last July. There is nothing better.

SUTTON AND SONS, Royal Berks Seed Establishment, Reading: This was certainly a splendid collection. The stand contained no less than 150 specimens of grass, useful and ornamental, all grown by this firm. The show of potatoes was quite remarkable, comprising 60 sorts: amongst them Sutton's Early Racehorse, Prince of Wales, Royal Ashleaf, King of Flukes—one of these weighing 21lbs. In mangels, the firm was scarcely up to their usual mark. There was a mangel of fine appearance, known as Sutton's Intermediate, which produces great weight per acre; also fair specimens of yellow globe, Elvetham long red. Of Sutton's Champion Swede, from the Royal farm, there were splendid specimens, their small tops and finely-formed bulbs striking the eye at once. Some supplied by Henry Crawshaw, Esq., Otlands Park, weigh 32lbs. each, and measure 14 inches in diameter, and are sound to the core. The green and purple kohlrabi, the green and purple top yellow hybrid turnip, together with

the Grey Stone, Imperial Green Globe, Red Paragon, and Pomeranian White turnips were of very fine and perfect growth. There were Drumhead cabbages, weighing 50lbs, carrots of many sorts, and the new Student's Parsnip. Their catalogues abound with the most flattering testimonials from those who have tried their seeds.

ARNOLD AND SONS, 35, West Smithfield, showed various implements, instruments, and fittings for the stable and farmer's veterinary shop.

ALFRED HALL, Westbury, Wilts, showed a stand of good roots.

J. COULTAS AND SONS, Little Gonerby Iron Works, Grantham, showed a specimen of their corn drill and corn dressing machine.

WILLIAM GRIFFIN, 22, Northwood-street, Birmingham, showed a chaff machine, and an ingenious contrivance to sharpen the knives of the same.

ROBERT MAYNARD, Whittleford, near Cambridge, showed his capital chaff cutting and sifting engine mounted on wheels, and especially adapted for letting out to hire. Pasted upon it was strong testimony in its favour, borne by the late Jonas Webb, Esq.

ALFRED NASH, Royston, Herts, showed a cheap efficient malt-screen.

RICHARD READ, 85, Regent's Circus, Piccadilly, made his annual display of veterinary injecting syringes, probangs, balling irons, garden syringes, watering engines, &c.

EDWARD WEBB, 142, High Holborn, London, showed his capital workman's draining level, a set of dairy apparatus, a patent lawn mower, and boxes of four silver tubes, for inserting into the teats of cows, to drain their udders of milk without the necessity of manual labour.

BURNBY & Co., Millwall, showed a large assortment of their excellent wrought-iron cattle-troughs and corn bins.

A. W. GOWER & SONS, Hook, near Winchfield, Hants, showed a specimen of a good lever corn drill, well known in Hampshire.

JOSIAH MOORE, St. James's-walk, Clerkenwell, London, showed models of ventilators for granaries, barns, stables, &c.

NALDER & NALDER, Challow Iron Works, Wantage, Berks.—This firm has taken their corn screen out of the combined thrashing machine, and made a simple and very excellent dresser of it. It separates perfectly, and forms perhaps the cheapest separator in the show.

RICHES & WATTS, Duke's Palace Iron Works, Norwich, showed one of their celebrated patent American grist mills, with cylinder of peculiarly hard iron heating metal.

JOHN SHAW, Junction Implement Works, Leeds, exhibited Gardener's well-known turnip cutter (with Shaw's recently patented improvements for protecting the cutters and barrel from the weather and manual injury), Corbett's Patent Pulper, oil-cake breakers, small chaff-cutters, and Boyd's well-known patent lawn-mowing machines, of which Mr. Shaw is the sole licensed maker.

DRAY, TAYLOR, & Co., 4, Adelaide Place, London Bridge, showed, amongst other articles, a very convenient portable forge, a good bench and vice, the prize oilcake breaker, and several corn crushing mills, of good construction, and a combined dressing and blowing machine.

ROBERT BOBY, Bury St. Edmund's, Suffolk, showed his patent haymaker, also the patent corn screening and dressing machine, in various sizes. The success of this implement has been wonderful.

ADAM C. BAMLETT, Bipon, Yorkshire, placed on his stand one of his mowing machines, and his patent prize rapping machine,

THOMAS LLOYD & SON, 15, Old Street Road, Shore-ditch, London.—This firm, which is now well known for the cheap, useful hand flour-mill and dressing machine, which are much used in the colonies as well as at home, displayed a large selection of the same, together with post mills, &c.

JAMES CORNBS, Barbridge Works, Nantwich.—This firm's chaff machine, to which for fourteen years in succession the Royal Society has awarded the first prize, was, of course, in force. There is nothing better.

J. B. BROWN & Co., 18, Cannon Street, City, showed a very business-like assortment of strained wire fence for horses, cattle, and sheep; wrought iron hurdles; wrought iron field-gates, park entrance gates, wicket gates; beautiful design of cheap "Premium" wire netting, &c.

PICKSLEY, SIMS, & Co., Bedford Iron Works, Leigh, Lancashire, showed a variety of useful food preparing machines, good and reasonable in price, together with capital pigtroughs, and the prize pair-horse reaper, which is improved by the addition of a weight, which just balances the drop platform, which regulates the size of the sheaf required, also a very simple, safe horse gear.

JAMES HUGHES & SONS, Great Dover Street, Borough, showed all sorts of millstones, of excellent construction; miller's tools, and driving bands; also Penny's patent expanding rotary corn separator, with adjustable wires, which took the first prize at Worcester. This machine is attracting much attention from exporters to India, China, Egypt, and Russia, being found useful in the ready separation of tea, rice, linseed, as well as grain.

BOYD, BOTELER, & Co, 76, Cannon Street, E.C. showed a large variety of garden implements, together with Boyd's patent brush lawn mower, and other implements for which they are agents.

BURCHFIELD & SON, West Smithfield.—Several chaff cutters, a flour mill, and capital weighing machines, and overhead horse powers.

CHARLES CARTER, Swan Lane, Thames Street, London, exhibited a fixed steam engine, a cheap cart, several food preparing machines, an assortment of chains, draining tools of good make, sack barrows, weighing machines, and horse harness.

WALTER ABBOTT WOOD, 77, Upper Thames Street, London, showed a one-horse reaper, a two-horse reaper, and a mower for a pair. These prize machines have been well received in this and other countries. The testimonials are of the highest character. It is stated that 10,000 have been made and sold during the past three years; and, judging from the list of prizes, as great a demand exists for them on the Continent as in Great Britain.

WILLIAM R. DELL, 72, Mark-lane, London, showed several specimens of his superior mill-stone manufacture, with millers' tools, together with his complete wheat-cleaning machine with separate and exhaust fans combined, and the smut machine, two excellent millers' friends.

WILLIAM SAWNEY, Beverley, showed the Royal prize winnowing machine, with a few slight improvements in the blast.

AMIES AND BARFORD, Queen-street Iron Works, Peterborough, came out strongly with their new patent ballasting field roller, which relieves a man of the necessity of cumbering his premises with rollers of different weights. The famous steaming apparatus is still popular, and a new water cart of cast-iron was to be seen high enough to fill a traction engine.

BURGESS AND KEY, 95, Newgate-street, London, exhibited the screw reaper, popular as ever; the sheaf reaper, which

has experience a most encouraging reception, and is certainly the most beautiful piece of automaton workmanship employed by the farmer; the mower, the praises of which are heard everywhere; the combined reaper and mower with rake; the combined manual delivery, and sundry chaff-cutters, churns, &c. Thoroughly good workmanship characterise all the machines manufactured by this firm.

JOHN P. AND EDMUND B. NUNN, Royston, Cambridgeshire, exhibited about the only novelty in the galleries, in the shape of a horse hoe; the shanks of the hoes, which were fitted into the hoe bar or frame, being furnished with disc knives. It is difficult to pronounce upon an untried implement, but we should advise the inventor to be sure that he can pitch the knives sufficiently.

WILLIAM SMITH, Kettering, Northamptonshire.—Of course, on this stand was to be found the admirable little steerage horse hoe, a cheap and efficient tool.

W. N. NICHOLSON, Newark, Nottinghamshire, showed the celebrated haymaker, in several sizes; the horse rake; various cake breakers, amongst the simplest, cheapest, and best; a good sack elevator, and a 2½-horse power portable steam engine.

EDWARD PAGE & Co., Victoria Works, Bedford, showed the Eclipse plough in several sizes, on a platform with ascending tiers; various sets of harrows; chaff-cutters; good draining, tile, and brick machine; and a combined horse hoe, and 5-tine grubber and moulding plough.

JAMES HOUSE, Market Lavington, Wiltshire, a patent mill for crushing granite, coprolite, or quartz.

SAMUELSON & Co., Britannia Works, Banbury, showed his self-raking machine, which seems, from the published testimonials, to have done well during the last harvest. The prize grass-mowing machine was also on the stand. The Gardner's turnip-cutter, which originated with this firm, is still made by them, with wood and iron frame, together with a very good pulper, chaff-cutters, roller mills, and a useful lawn mowing machine.

PRIEST & WOOLNOUGH, Kingston-on-Thames, showed a series of their Norfolk, Suffolk, and Surrey corn drills, together with their manure distributor, and patent horse hoe. The improvements made by the addition of a removable cutting part to the coulter is found to answer, as well as the substitution of the cast for the wrought-iron share to the plough.

EDWARD HAMMOND BENTALL, Heybridge Works, Maldon, Essex, made a very extensive display in that department of which he is king—namely, the food-preparing machines. The workmanship of these is exceedingly good, and their mechanical construction generally excellent.

THOMAS AND ROBERT SHEEN, Aylesbury, Bucks, showed several chaff-cutters and a couple of good corn mills.

JOHN SPENCER, 14, Corn Market, Doncaster, showed a horse rake with seed drill attached, and a potato separator, worked by hand on a very good principle indeed. The latter is a machine likely to come into general use amongst the extensive potato growers of Yorkshire, Lincolnshire, Essex, &c. For the size and workmanship it is cheap (£3).

SAMUEL WARREN, Ledbury, Herefordshire, showed a very good patent inclosed two-horse gear.

THOMAS SMITH & Co., Vulcan Works, Ipswich, Suffolk, showed sundry sets of useful harrows, a patent horse rake, and cultivator.

CARSON & TOONE, Wiltshire Foundry, Warminster, Wilts, showed Moody's turnip-shaver, manufactured by them; a good substantial chaff-engine, for steam power; sundry presses, and a sensible two-horse gear.

HILL AND SMITH, Brierley Hill Iron Works, Dudley, Staffordshire, had a large display of flat and round bar fencing, of ornamental hurdles, entrance gates and pillars, field gates, together with game-proof wire netting, iron tree guards, and wrought iron cattle cribs, sheep troughs, wheelbarrows, &c. They called attention also to an improved strained wire fence, with tangential winding straining pillars, patent tubular galvanized intermediate posts, and galvanized wire rope; it is run 4 feet high, is intended to resist the heaviest cattle, and for exposed situations; 8d. to 6d. per yard.

GOSS AND PEENE, Rayne, Braintree, Essex.—A series of root graters, cake breakers, and a chaff cutter.

JAMES SMITH AND SONS, Peasenhall, Suffolk, so well known throughout England by their drills, had several of them on their stand. One improvement we observed: instead of the slides, shutting off the supply of seed, being separate, they are now all under the command of the driver, by means of a lever, which shuts and opens them simultaneously.

T. BAKER, Compton, Newbury, Berks, showed a good liquid manure and water cart.

CHARLES CLAY, The Stennard Works, Wakefield, showed his patent cultivator, of excellent construction, the model of a cultivator for steam power, which works backwards and forwards, without turning; a patent chain harrow, in which the links, being so formed across the harrow, keep themselves stretched at full length; &c.

R. R. HUNT, Earls Colne, Halstead, Essex, showed his clover seed drawer for steam power; good two-horse gear, with intermediate motion; and sundry food-preparing machines.

BARNARD, BISHOP, AND BARNARD, Norwich, showed Dr. Agger's digger, and one of their own lawn mowers.

RICHMOND AND CHANDLER, Salford, Manchester, made their usual fine display of useful and beautifully-constructed machines for chaff cutting, corn grinding and crushing, turnip cutting, and root washing. They showed their two and four-horse gear works, which are most simply and suitably arranged; and the kneader, which is intended to give us better mixed and cleaner bread.

HUNT AND PICKERING, Leicester, showed a corn drill, and steerage horse hoe to match; several ploughs, for which they have a local reputation; a useful combined moulding plough and horse hoe, several corn crushers of good construction, root pulpers, and cake breakers.

ROBERT AND JOHN REEVES, Bratton Iron Works, Westbury, showed Chandler's liquid manure drill, their excellent manure distributor, several specimens of their useful prize drills, and the handy little thistle extirpator.

We find before us a few bills and catalogues concerning implements not inserted in the catalogue, such as W. C. CAMBRIDGE'S (of Bristol) combined tine and chain harrow and clod crushers; J. WARNER AND SON'S (8, Crescent, Cripplegate, London, E.C.) pumps; GREENING AND Co.'s (Manchester) specimens of wire and iron fencing; RADCLIFFE'S (22, High Holborn) "Gregory's patent chaff cutter"; E. MANCUR AND Co.'s (4, Wellington-street, Blackfriars) pocket and very simple weighing scales; and, though last, by no means least, WILLIAM SAVORY AND SON'S (Gloucester) double engine steam ploughing apparatus, which has done such good service in stimulating thought and action towards the solution of the steam problem.

ROYAL AGRICULTURAL SOCIETY OF IRELAND.

The half-yearly meeting of the members of this society was held on Friday, Dec. 18th, at the rooms, 42, Upper Sackville-street. The chair was taken by His Grace the Duke of Leinster. Captain THORNTON, the secretary, read the Report as follows:—

“My Lords and Gentlemen,—In presenting the half-yearly report of the proceedings of the society to this meeting, your council feel great pleasure in stating that it continues to receive very general support, fifty-seven members having joined it since your last meeting. Your council cannot, however, refrain from expressing their regret that many noblemen and gentlemen largely connected with the landed interest, and who derive very great advantages from the exertions of your society, by the introduction of first-class breeding stock and agricultural implements into the provinces, still withhold their aid and influence. Your council consider that this example tends much to prevent the tenant farmers from more generally becoming members, and competing at your annual cattle shows. It is to be hoped that the movement made lately in many parts of the country, to establish union local farming societies, will prove successful, and that it will be an inducement to those noblemen and gentlemen who have up to the present withheld their support to come forward and assist your society, by giving such prizes as will stimulate the working farmers to adopt a more enlightened system of agriculture, and enable them to compete, not only at the local societies' shows, but at the national exhibitions of your society. It will be in the recollection of most of the members that, at the national cattle show, held in Limerick, in 1862, the judges of sheep in classes F and G recommended that the Cork Challenge Cup should be withheld, on the grounds of want of merit. In class G, Captain Broughton exhibited a shearing ram, to which the first prize of ten pounds was awarded. He conceived that such award carried with it the challenge cup, there not being a ram in class F to compete with him. Captain Broughton's claim was fully considered by your council, and, after mature deliberation, they came to the conclusion that they had no other course but to sustain the award of the judges. Captain Broughton placed the matter in the hands of his solicitor, who attended several of the meetings of your council, when the subject was again fully considered, and, after much discussion, it was agreed that a joint case should be prepared, and, when approved of, submitted to the Solicitor-General for his opinion, both parties being bound to abide thereby. The case was accordingly forwarded to Mr. Lawson, who advised as follows: ‘I am of opinion that the council have the power of withholding the cup from Mr. Broughton.—Signed, James A. Lawson.’ The cup was accordingly withheld. The annual cattle show of your society, at Kilkenny, was very successful. The warm thanks of the society are due to the local committee, judges, stewards, director of the showyard, and to the local secretary, for the efficient discharge of the duties imposed upon them. The animals entered for competition in the several classes (except those competing for the Croker challenge cup) were, generally speaking, of a first-class character. The implements were also of a very superior description.

“The following is a statement of receipts and disbursements, viz. :—

NATIONAL CATTLE SHOW, KILKENNY, 1863:

BALANCE-SHEET.	
<i>Receipts.</i>	
Amount received from the local committee	£500 0 0
Balance to debit	405 3 4
	£905 3 4

Disbursements.

Expenses of deputations to Kilkenny ..	£7 10 6
Accountant and assistants' expenses to show..	13 7 8
Travelling expenses of judges.. .. .	110 2 0
Printing, advertising, and sundry small payments	60 16 1
Mr. Corrigan's expenses, £10 12s. 6d., and gratuity, £10	20 12 6
Accountant's assistants, preparing for show ..	3 10 0
Money premiums, awarded	652 5 0
Two gold and eighteen silver medals.. ..	30 0 0

£905 3 4

The attention of your council was particularly called to the description of thorough-bred horses competing for the Croker challenge cup. The judges appointed to adjudicate thereon considered they were so very deficient in the qualities required by the conditions, that not one of them was fully qualified for the prize. It was, however, thought desirable to award it to an English horse named Claret, as coming nearer to what was required than any other of those exhibited. The question of the breeding of horses, and the deterioration that has taken place thereon, consequent on the inferiority of thorough-bred sires in Ireland, had for a considerable time occupied the attention of many of your members. The subject was brought under the notice of your council at Kilkenny, by Sir John Power, Bart., one of the judges before alluded to, when the statement made by him appeared so intimately connected with the agricultural prosperity of the country, that the subject was postponed until the next meeting of your council in Dublin. Sir John Power accordingly attended at a very large meeting on Thursday, the 24th September, and brought forward the matter very fully, reading several letters from noblemen and gentlemen, fully confirming his statement that the superior and useful class of horses which formerly abounded in Ireland was now nearly extinct. Your council, after full consideration of the matter, appointed a committee, consisting of the Earl of Beaufort, President of your society, Lords Crofton and Dunlo, Sir John Power, Bart., Sir Percy Nugent, Bart., Mr. H. J. Macfarlane, Major Borrowes, the Hon. King Harman, Hon. Thomas Preston, with power to add to their numbers from parties not necessarily members of the society; and it was resolved that the entire subject be referred to the committee, whose duty it will be to place themselves in communication with parties most likely to afford valuable information, and to report at a future period as to the best mode of providing a remedy for the evil complained of. Your council have accepted the invitation of a very influential and numerous signed requisition from the noblemen and gentlemen of Sligo and the adjoining counties to hold the annual cattle show of your society for 1864 in that town. A deputation from your council visited Sligo, to ascertain if a proper site for the show-yard could be selected near the terminus of the railway, and if the necessary facilities for the carriage of stock and implements by sea could be had. The deputation reported very favourably on the several points; and your council feel certain that the district will derive much advantage from your visit, as your society has not previously held a meeting in that part of the province of Connaught. The directors of the Midland Railway Company have, with marked liberality, undertaken to carry all stock and implements to the show free of charge, and all returning unsold at half freight. Such an undertaking cannot be too highly appreciated by your society. An example so liberal, if followed by all other directors of railway companies, would tend much to induce stock breeders and implement manufacturers to exhibit more generally at your shows. Your council feel great pleasure in stating that the local farming societies in connection with the central one continue to disseminate their usefulness. Your council regret that the working farmers do not more generally attend such assemblies, and take advantage of the information afforded at

such meetings. Your council regret that their efforts to carry out the third object of your society, viz., the improvement which may be effected in the dwellings and domestic condition of the farming and labouring classes in Ireland, have not been attended with greater success. For the provincial gold medals and the valuable challenge cup presented by his Grace the Duke of Leinster, for newly erected labourers' cottages, there were only five competitors, all in the province of Leinster; and for the medals for improved previously existing cottages there has been only one entry. Your council cannot conclude without expressing a hope that next year the funds of your society will increase so as to enable them to continue the prizes to the local societies for the encouragement of the small farmers, and stimulate their exertions in the rearing of young stock, which has of late years been so much on the decline. The subject of the encouragement of the growth of flax has naturally engaged the attention of many members of your council; and it has been thought desirable that it be referred to the premium-sheet committee whether it would not be advantageous to offer a premium for the most improved machine for preparing flax, such as can be worked by the ordinary horse power at the disposal of farmers.

"GEORGE HODSON, Bart., Chairman.
"November 26, 1863."

Sir GEORGE HODSON, in moving the adoption of the report, said the council had alluded, and very properly alluded, to the apparent spathy of many noblemen and gentlemen largely connected with the landed interest, who had not yet joined the society, thereby withholding whatever influence they possess in the objects they sought to forward. Any one who compared the state of agriculture in this country, as it exists at present, with what it was twenty-five years ago, must see a very great difference; and without presumption, they might reasonably attribute it to the efforts of the society in bringing about so desirable result, and those noblemen and gentlemen who profit by such an improved state of things should come

forward and assist the society. The printed draft report read by the secretary did not contain one paragraph read by him which was relative to offering a premium for a machine for preparing flax, capable of being worked by the ordinary horse power at the disposal of farmers in this country. The council had thought the encouragement of flax at this juncture of great importance, and considered a premium of the kind very desirable. They had every reason to be extremely thankful to the Midland Railway Company for their liberal offer with regard to the transit of cattle to the show to be held at Sligo next year. The council regretted that for the premium offered for labourers' cottages the competition was not larger. Measures were about to be taken by the premium sheet committee which, they hoped, would cause a large competition. The report had been well considered, and he had much pleasure in moving its adoption.

Mr. ROBERT FOWLER seconded the resolution, which was adopted.

Mr. H. J. MACFARLANE said no direct step had been taken with respect to the flax question. They all looked forward with great interest to efforts being made in the coming year to grow flax in several parts of Ireland, where, for a long time, its cultivation had been neglected. What had been done had been done on a very small scale. But he thought that might be for the better, inasmuch as each individual farmer should be encouraged at first to grow by small degrees. He hoped the subject would continue to receive the attention of the council.

The report was then put to the meeting, and passed unanimously.

Mr. FOWLER moved the marked thanks of the meeting to his Grace the Duke of Leinster, for his kindness in presiding at the meeting, and for the interest he manifested on all occasions in the interests of the society.

The resolution having been seconded, was passed unanimously, when the proceedings terminated.

MANAGEMENT OF A BREEDING HERD.

[THE SECOND-PRIZE ESSAY OF THE ROSS SOCIETY.]

By G. MURRAY.

This department of farm management is becoming yearly of more importance not only to the agricultural interest of this country, but also to the community at large. With a rapidly-increasing population, under the ordinary system of management the production of beef and mutton will in a few years be inadequate to the consumption. As has been fairly demonstrated within the last two years, the foreigner is able to supply us with corn in almost any quantity, and at prices far below that at which it can be profitably produced by the British farmer. With stock the case is a different one. In this department of rural economy the British farmer cannot be surpassed, the greater part of the United Kingdom having a climate peculiarly well adapted for the breeding and feeding of cattle and sheep. The best breeds have attained an aptitude to fatten and a tendency to arrive at early maturity not to be equalled by the domesticated animals of any other part of the globe. In discussing this subject it will be impossible to give the exact number of stock that can be kept on a farm of a given extent, without inspecting it, or knowing something of the quality of the soil, the situation, climate, &c. We will therefore, in the present instance, principally confine ourselves to the quantities of food the animals require to keep them in a state of health and progression, leaving the farmer to regulate the number of stock according to the power of the soil to produce food for their support. By way of illustration, and as being suitable for our calculations, we will assume the farm in question to contain 250 acres of land, worth from 37s. to 40s. per acre, and capable of growing fair crops of roots and cereals, 50 acres of this farm being, according to the stipulations attached to this essay, in meadow and permanent pasture, leaving 200 acres under cul-

tivation; which, if managed on the four-course rotation, would give—

	Acres.
Turnips.....	50
Spring corn, barley, oats, or wheat	50
Seeds.....	50
Wheat after seeds.....	50
	200

On all soils, with the exception of strong clays and thin limestone, the six-course system is much to be preferred, as the same number of acres of corn will be grown in the one case as the other, the labour bill will be considerably lessened, more stock can be kept, and undoubtedly more wheat per acre can be grown on the generality of light soils where the climate is suitable than where the four-course is rigidly followed. Under the six-field system of management the following will be the rotation—

	Acres.
1st year, turnips.....	33½
2nd year, barley, oats, or wheat after roots..	33½
3rd year, seeds first year	33½
4th year, seeds second year	33½
5th year, wheat after second year's seeds ..	33½
6th year, barley or oats after wheat	33½

As before, 200

Thus it will be seen that the same number of acres of corn is grown on the six as on the four field system, with this difference, that there will be 16½ acres less wheat on the six than on the four field, but 16½ acres more barley or

oats. With present prices of corn this is of but little importance, as the value of an acre of barley or oats has recently in many cases been equal to the value of wheat, that is acre for acre. This present season our barley crops averaged considerably more per acre than our wheat; but should times improve, and prices become again more remunerative for wheat, the deficiency in acreage could easily be made up by yearly sowing a part of the turnip break, say 16½ acres, which would then bring the acreage of the different kinds of corn-cropping equal on both systems; while on the six-field course the acreage of grass would be increased by 16½ acres. And on the principal part of the soils on the old red sandstone, particularly in a moist climate, like that under consideration, the second year's seeds would carry a much greater quantity of stock than that of only one year's growth. The breadth of land under turnip fallow would likewise be reduced by 16½ acres, thereby greatly lessening the expenses of labour; and as there would be abundance of manure made from the quantity of straw grown and the extra number of stock that would as a natural consequence be kept, after manuring the whole of the fallow or turnip land at an extra rate, there would still be a sufficient quantity left to give the first year's seeds a light dressing in autumn. After the separation of the crop from the land this would be found of great benefit, not only to the young clover, but also to the succeeding crops of corn. On a farm of this size, worked in the way we have described, five horses, with the help of the farmer's nag or a brood mare for jobbing in busy times, would on most free soils be sufficient to work it well. But to come more directly to the subject of this essay—the management of a breeding herd—we will suppose the cows well bred of their kind, are of sound constitutions, well-proportioned bodies, with a kindly disposition to fatten, and aptitude to arrive at early maturity; that the bull is descended from a long line of well-known good animals, and possessing the points necessary to constitute a first-rate sire.

The bullings of the different cows should be registered by the cowman in a book kept for the purpose, and should be transferred from time to time into one kept by the master. This we find to be of great use as the time of calving draws on, the animals sometimes requiring different treatment. A week or ten days before their time is up, they should be separated from the rest of the herd, and kept in a loose box: if there is any disposition to milk fever or fall, we keep the cows on bran, grain, or other sloppy food, and confine them to a short supply. A week or so before calving we give one or two drinks, consisting of half a pound of Epsom salts and half a pound of sulphur in a quart of thin gruel, and repeat the dose as soon as the calf is dropped. And although our cows are in high condition, we seldom have any loss from this cause. The season of the year at which the calves are dropped is of the greatest importance as affecting the dam and her progeny. Calves dropped during the winter months, that is from November to February, if well kept and attended to, have much the advantage of those dropped from March to the middle of June. The early ones would be ready to go into young seed or grass fields by the middle or end of May, when they would be able to maintain themselves in a satisfactory state of progression, with an allowance of two pounds each per day of oilcake, while the latter one will not be fit to go to grass till the following spring. Cows that calve during the winter months, as a rule, require a much greater outlay to keep them in a state of fair condition, than in-calf or dry cows. The drain on the system in consequence of the milking necessitates a greater quantity of more nutritious food to maintain the animal in an equal state of condition. Taking all things into consideration, we think the best time for the principal part of the herd to calve is January, February, and March. By the middle of April or the first week in May the grass or seeds will be fit to receive them, and where they can be kept at much less cost to the farmer. Some difference of opinion exists amongst practical men as to the best way of rearing or weaning calves—whether they should be allowed to suck their dams, or be brought up by hand. Having had considerable experience in this department of farm management, we have no hesitation in saying that as far as regards the health and progress of the calf, that of following nature,

and allowing the young animal to suck its mother at will, is the best, though on principles of economy is not the most profitable. When the calf is allowed to suck the mother, we invariably find a less inclination on her part to take the bull; and even when she does so, she is less likely to again become pregnant. In 1860 we tried this plan, but only two or three of the cows stood to their bulling till after the calves were weaned. When this happens in a regular herd kept for breeding exclusively, both loss and disappointment are the result. The way we now proceed is, to allow the calf to suck the cow for the first two or three days. When they are able, and ought to drink from the bucket, we still continue the new milk for the first four weeks, after which they have skimmed milk, mixed with boiled linseed, and seasoned with a small quantity of cattle condiment. As soon as they begin to eat, we give them some sliced roots, and some nice sweet hay-chaff, mixed with a small quantity of wheat-flour (tail). This flour with the bran in it is an excellent food for young animals. They are particularly fond of it, and thrive rapidly when so fed. We continue the milk for the first three months, when we consider them fit to support themselves on other food. Many are of opinion that heifers should not have their first calf until they are three years old. My own experience is not in favour of this plan, as high-bred stock, if not put to the bull at an early age, often become too fat to breed with any degree of certainty. Cows, under good management, should bring a calf in about every eleven months; and if not regular breeders, should be fattened off. If the production of superior bullocks is the point principally aimed at, without regard to the produce of the dairy, the cows, as before stated, should calve early, in November, December, or January, and the young animal be allowed to suck the whole of the milk until about the month of May, when they will be fit to wean and send to grass. The cows should then be dried of their milk, and either fed off for the butcher, if not in calf, or, if in calf, put on a poorer pasture. The calves during the summer should either have a temporary shed for shelter in the field, where they can have their cake, or if not, they should be taken into the yards during the heat of the day, where they will receive their cake. We give ours from 1lb. to 2lb. each of good linseed cake, and find them thrive much better for this small outlay. This season we made an experiment with cotton cake, instead of linseed; but after having used it for some time, we lost in the course of a fortnight six of our best calves. We were at first puzzled to account for their death, as, on making a *post-mortem* examination, we could trace no appearance of disease. We had the assistance of a duly-qualified veterinary surgeon, who was equally at a loss to account for their sudden death, as they would to all appearance be right, and in a few hours be dead. Suspecting the cotton cake to be the cause, we had a sample of it tested by a competent authority, who pronounced the cake to be of superior quality, of the kind. Being determined, if possible, to discover the true cause, we had the stomach and its contents analyzed, when still no traces could be found to create suspicion; and it was only on examining the inner coating of the stomach with a powerful microscope that the true cause was discovered. The inner coating—that is, the mucous or villous portion—readily separated from the cuticular part. The glands of the stomach we found to be completely filled, and their power of action destroyed, by the cotton fibre and part of the husk becoming attached to them. A regular supply of pure water is of the utmost importance to all kinds of stock, but more particularly to in-calf animals. The yards should also be well sheltered; the buildings round them should be spouted, which will not only effect a great saving in litter, but the health and comfort of the animals are greatly increased. Cattle, when kept in airy and well-sheltered yards, will not consume near the quantity of food, and yet thrive much better than others will when exposed to an inclement atmosphere and standing half-way to their knees in mud and water. Where the farm-yards are conveniently situated to the grass land our practical experience is favourable to turning out the in-calf cows and heifers for a few hours daily in the grass-fields during the winter months, as we think a certain amount of exercise produces a beneficial influence not only on the health of the animal, but is also conducive to the healthy development of the fetus in the womb. The next point to be considered is the number of cows that can be kept on the extent of farm

and under the system of management we have been considering; but, as before stated, in the absence of any knowledge of the quality of the soil, &c., this can only be an approximation, as there are a variety of local circumstances effecting this. Assuming that the produce is sold at about two years old, the month of April or beginning of May is the best time, when they would be sure to command a good price, either for the butcher or the grazier, according to the condition of the animal and state of the markets. We would purpose mowing yearly not more than thirty to thirty-five acres of the old grass or meadow-land, being fully persuaded, after long experience, that there is no crop the farmer grows that pays so little per acre as his hay crop, except in solitary cases, where the produce is allowed by the landlord to be sold off the farm; in many instances a great quantity of hay is wasted, or, under a different system of management, can be altogether dispensed with. The number of cattle we would purpose keeping is 17 breeding cows and heifers and their calves, selling the produce at about two years old; there would thus be 17 head of cattle to sell every spring, and would consist of, say 8 to 9 steers, the others being heifers or draft cows, which would be replaced by keeping an equal number of two-year-old heifers, and thus keep the herd in a state of progression. The entire herd would consist of 17 cows, 17 two-year-olds, 17 yearlings, and 17 calves; the calves would consume little or no hay or roots the first winter, so that the actual number would be 61 head of cattle and 6 horses. We would keep the whole of the cattle on cut chaff and pulped roots, this being the best and most economical system of feeding: the cows and two-year-olds would require 56lbs. pulped roots daily, mixed with 40lbs. cut chaff; this chaff would consist of $\frac{1}{2}$ straw to $\frac{1}{2}$ hay; the cost of cutting the straw and hay together into chaff would, by steam or horse power, be about 6s. per ton, and by attaching the pulper to the same power the roots can be pulped and mixed at the same time at a small additional cost; the 30 acres of meadow, cut for

hay, would produce at the least, in ordinary seasons, 40 cwt. per acre, which would be a sufficient quantity to give each from 16 cwt. to 1 ton. We find this quantity an ample allowance. For the last three years we have wintered upwards of 100 cattle, of different ages, and 16 horses; and the whole of our hay-crop consists of 27 acres of meadow. Of the 33 $\frac{1}{2}$ acres of roots, we would draw off one-third, or 11 acres; the other two-thirds to be consumed on the land by sheep eating cake or corn; the 11 acres would, on a low calculation, produce 20 tons per acre; or, in round numbers, 220 tons. The 17 cows and 17 two-year-old steers and heifers would require 4 $\frac{1}{2}$ tons each, or 153 tons in all. The 17 yearlings would require 2 $\frac{1}{2}$ tons each, or 88 tons in all. Those coming two years old should, in addition to this allowance, have 4lbs. each per diem of good cake, which might consist of cotton cake for the first three months, and lissed for the last three; the cows and yearlings would not require any artificial food, and generally thrive much better when turned to grass, than when pampered on cake, meal, &c.

The 20 acres of old grass would keep the yearlings during the summer, until the hay is carried and the lattermath gets up, when they might be turned on there for a change. The 17 cows will have sufficient keep on the one year's seeds, 33 $\frac{1}{2}$ acres; the 33 $\frac{1}{2}$ acres of two years seeds should be grazed by sheep, and the calves amongst them. The first year's seeds should never be grazed by sheep if it can possibly be avoided, as they greatly injure them for the next year.

The cheapest system of keeping the farm horses during the summer is to keep them in the yards altogether, and feed them on green food—a few acres of the first year's seeds can be fenced off and cut for the purpose; by this means a much less quantity of land will be sufficient than where they are allowed to range at large.

In the above remarks I have given my own experience as to the management of breeding herd, and leave others to draw their own conclusions as to whether or not they are applicable to their own particular circumstances.

PRESENTATION TO THE REVEREND W. HOLT BEEVOR.

Cowbridge School is the oldest in the county, and was established first as a feeder of the Welsh University at Llantwit in the reign of Etheldred. Since that period it has undergone many changes. For the last thirteen years it has been under the mastership of the W. H. Beavor, and never in its existence has it attained the high position it now has, as a first-class Grammar School, a very large number of scholars having become distinguished in their subsequent career for their educational attainments. In 1856, two scholarships at Jesus College, an open Scholarship at Trinity, and the Newdegate, were awarded to pupils from this school. In 1858, two exhibitions at Jesus College, the Copleston Exhibition, two Scholarships, and several First Class honours were awarded. In 1859, three out of five open Scholarships were awarded to this school. Since that period many distinctions have been gained by the pupils of this school while at the University of Oxford. There can therefore be no surprise that, when the news of the resignation of the master became known, the scholars generally felt the loss they were about to experience. Not only has Mr. Beavor gained distinction as a teacher, but by his pupils he is beloved and also highly respected by the inhabitants generally. When the time for the termination of Mr. Beavor's labours had nearly arrived, a committee of the scholars at the school, and the old pupils, was formed for the purpose of presenting him with a testimonial as a slight mark of their respect and esteem. For this object subscriptions were received from all the old and present scholars. The committee, having resolved that the testimonial should take the form of an epergne, placed themselves in communication with Messrs. Savory, the extensive

jewellers of Cornhill, London. The selection reflects great credit upon the taste of those concerned. The design of the epergne is peculiarly unique: three palm-trees rise from the centre, the roots and ground forming a natural pediment to the superstructure; the stems unite closely together at the top, and the spreading leaves support an elegant flat vase of ground glass; the leaves and small flowers at the roots are beautifully frosted, forming a costly and elegant centre ornament for the table. On one side is engraved the arms of the master; on the other the crest. In front are the Cowbridge arms, beneath which appears—"To the Rev. Holt Beavor, from his old boys, December 11th, 1863." So quietly had the arrangements been conducted, that few persons knew anything of the presentation till the day previous, when one of the older scholars informed the master of their intention. The schoolroom on Friday was tastefully decorated, and at 12 o'clock, the present, and many of the old scholars assembled in it, while Mrs. Beavor and a few friends were invited in. The presentation then took place, Mr. T. Fowler addressing Mr. Beavor in a few well-chosen sentences, and the latter making a feeling response.

Mr. Beavor is well known in the agricultural world, and has been mainly instrumental in introducing a better description of stock, such as shorthorn cattle and Suffolk horses, into Glosmorganshire. He is also the author of "NOTES ON FIELD AND CATTLE," a work to the worth of which we had much pleasure in speaking on its first appearance a year or so since. In this "The Amateur Farmer" gives his own notions and experiences, heightened by all the charms of a refined style and thoroughly good taste.

THE CATTLE-DISEASE QUESTION.

No. I.

In the investigation of the sanitary condition of our live stock, are we not laying too much stress upon the importation of disease from the continent of Europe? and attaching too little weight to the abnormal condition of our own cattle at home? It is certainly a very superficial mode of reasoning, to talk of plague-growing spots upon the face of every part of the globe save England. For, granting that such has really been the case hitherto, what guarantee does such an argument afford for the future this country will not also have its plague-growing spots? The only satisfactory answer that can practically be given to this question is obviously not in favour of this country, so long as we follow the present system of stock management. No great length of practical demonstration will be necessary to prove the soundness of this conclusion; for so long as we breed a delicate, and even diseased race of animals, more than ordinarily liable to contagion, the upshot need not be told.

The true course for the British farmer to pursue is, to produce a more healthy stock with greater profit at home, and thereby teach foreign farmers to follow his example. This proposition is, doubtless, not a very flattering one to those of their number who entertain the fallacious notion that the system they now pursue is perfect as to principle, and the reform one that cannot be improved upon, unless by forcing animals to a greater degree of obesity, with its concomitant maladies, than is at present experienced; but the rapid progress of disease at the present time, and the ruinous mortality in so many herds and flocks, will bring them and the bulk of farmers as a body to take a more intelligent and comprehensive view of the subject. It will, for example, compel them eventually to examine the sanitary details of their present system of stock management from a scientific point of view, in order to ascertain what the diseases now complained of are, both in a chemical and physiological sense, so as to be able to solve the problem as to what the primary cause is; how it can be obviated; and the practice required to breed and fatten a more healthy race of cattle both at home and abroad. If it is admitted as fact—a conclusion which few will deny—that the British farmer is acknowledged the most successful breeder and feeder of live stock, and that the foreign farmers who are just now sending to this country so much diseased live meat are using every means in their power to follow his example as a rule, then such a conclusion may be taken as presumptive evidence that if the home farmer would improve his practice, so would the farmers of the continent of Europe; and such being the practical rule observed by them, it follows that eventually they would have no diseased stock to export; for unquestionably the rearing and fattening of healthy cattle, both for their own markets and ours, would pay them better than their present abnormal system, although perhaps the present one pays them better than a worse.

The difficulty in carrying into practice this proposition obviously lies at home, in convincing the British farmer that for the last half-century something has been radically wrong with his compass, and that the noble ship has been all this while sailing farther and farther from the true course of progress, consequently there is no alternative left but to go back, take a new meridian, and start again under the guidance of a better compass and a more correct notion of the declination of the needle. In other words, it will be no easy matter to convince the farmers of this country that for upwards of half a century the general system of feeding and managing cattle has been gradually growing more and more abnormal or unnatural, and that they must pay more attention than they have hitherto done to the physiological requirements of live stock of every kind, in order to improve their health and the quality of the beef, mutton, and pork they yield for our tables.

"But will it pay?" This is the never-failing set-off to

every proposition involving any departure, right or left, from the beaten path of the common practice followed, let that be what it may—paying or losing, or an empty balance, so to speak, between profit and loss. When properly stated, as a practical question between two rival systems, it may be put thus: "Will the rearing and fattening of healthy cattle pay better or worse than the rearing and fattening of unhealthy stock?" And to this we shall allow our readers the privilege of appending their own answers, the one way or the other, as they may see fit to do, observing that the public is fast making up its mind to give the question the following practical and tangible answer, viz., "No money for diseased meat," a finale that is already beginning to affect the balance-sheets of not a few who send such carion to the metropolitan markets.

What is the difference between healthy and diseased live meat, and healthy and diseased dead meat, in a chemical sense? This may, with much propriety, be given as a reasonable problem for Christmas, when our heavy fat stock shows are being held. It is not always the fattest, plumpest, and best-looking animal, judging from external symmetry, for example, that turns out the finest quality of meat. The fact is notorious that the contrary of this is oftener the rule than the exception; the naturally fed oxen and sheep of our mountainous districts, as Wales and the Highlands of Scotland, yielding beef and mutton infinitely superior in quality to what we get from our Christmas exhibitions, markets, and "great days."

These are facts that speak for themselves, furnishing at this festive season of the year both timely reproof and instruction not only to farmers but to all and sundry interested, including breeders, feeders, and consumers. The public who consume the gross-fed Christmas meat have, if possible, more to learn than those who produce it; for so long as they follow their present routine habits of grumbling only, using at the same time an extra allowance of seasoning, wine, and other estheras, and giving no more for the healthy meat than they do for the abnormal stuff, they can hardly expect a speedy reformation to the better. Practically speaking, the lesson which they (the consumers) have to learn is, to give a much higher price for the fine qualities of meat, and to return the abnormal stuff as "not accepted" at any price. Send all such direct to the dog-kennel and knacker's caldron! This is, perhaps, on their side more than ordinarily brief, but the reason is obvious, for the farmers' problem is ours, and we hasten to discuss its solution. Were fine quality of beef and mutton double its present price, for example, and the extra fat meat of this season and the inferior lean quality produced by animals of obese constitutions, or, in one word, all abnormal meat, to become unsaleable, it would unquestionably bring producers speedily to a just sense of the present system of stock management now generally pursued; and perhaps nothing much short of this will effect such a desideratum. But be this as it may, the progress of things in physiology cannot be long diverted from their natural course, so that eventually the conclusion is manifest that the normal system will carry the day triumphantly against the abnormal. In other words, cattle must be healthy and of good constitutions before they will yield fine meat; and to preserve such a state of health they must be fed on natural food.

What is meant by natural food, and a healthy constitution? These appear plain questions, and somewhat tangential to our subject—the cattle disease question. At the same time, as "prevention is better than cure," this is obviously the more interesting side of the matter to the farmer, more especially if diseased meat, or the flesh of unhealthy abnormally fed animals, is to fetch nothing, and the beef, mutton, and pork of healthy naturally-fed stock are to realize double price; for such involve a tangible and very weighty consideration, from whatever point of the compass it may be examined.

The only answer we shall give to this question, at present, is briefly, that our cattle are not fed on natural food; consequently they are not healthy, and never can be so whilst under this abnormal system of management. And this applies with equal or perhaps greater force to live stock on the continent of Europe, where the atmosphere is more frequently and more densely loaded with all kinds of contagious matter. Such, then, being the facts of the case, the conclusion that follows relative to those extreme cases of disease now prevalent is not only manifest, but easily accounted for, generally speaking. In other words, the facts of the case show that it would be unreasonable to expect anything else than what is now experienced.

Such a conclusion requires to be closely examined both from a chemical and physiological point of view. This, too, is unfortunate; for neither of these is as yet sufficiently well understood to permit of practical details being advanced, and perhaps the former (chemistry) is the farthest behind of the two; our concluding observations, therefore, must be of a very general kind, purposely advanced to institute inquiry and progress, rather than settle established data.

Taking chemistry for illustration, thus far is known—that all sorts of organic and inorganic matter are subject to two forces, the one attractive and the other repulsive; and it is more than probable that these two forces have much more to do in the animal economy, or in the natural chemistry of the animal economy, than is perhaps generally credited. But be this as it may, granting for the sake of argument that such is true, then we have a satisfactory reason why bluebottle flies are attracted by means of their chemical senses to bad smells, as diseased meat—why they prefer abnormally-fed dead meat when newly slaughtered, to that which is naturally fed; in other words, why they are attracted by the former, but repelled by the latter; and why, if you wash your dead meat with a dose of strong tansy water, it keeps off the bluebottle gentry altogether. It also furnishes us with a tangible solution to the problem why the abnormal meat, now common, must be used when newly-slaughtered, otherwise it will be green with fungi, or stink, &c. Again, it also satisfactorily accounts for the fact that when the mucous membrane of the air passages, and of the different parts of the alimentary canal, as the stomach, and to which may be added the mucous membrane of the hepatic organ, are in an unhealthy state, they are affected by different kinds of worms; while healthy animals, fed on natural food, are free from such internal parasites; because in the former case the organic substance, whatever form it may be in, is attracted by the unhealthy mucus but repelled by the healthy mucus in the latter case. In a similar way catarrhal and other epidemical complaints are accounted for.

Applying these observations to our subject, the practical question raised is this: Are the contagious maladies now prevalent amongst cattle an exception from the above rule? And to this a negative answer must obviously be given; for it is a well-authenticated fact that plague and all such are more prevalent and fatal where a low state of health and uncleanness prevails, and that by cleanliness and the free use of certain repellent medical substances the contagious matter may be kept off from the body. The reason why our rich hill-fed beef and mutton will keep for ten days and even longer, when the abnormally-fed meat will not keep twenty-four hours, is—because the former contains a large seasoning of antiseptic and other medicinal properties derived from the herbage consumed, and which is always present in the natural food of our cattle, whereas the latter (the abnormal meat) is not only deficient of such antiseptic properties, but it contains much imperfectly-organized matter and abnormal compounds formed by them of the very opposite character, viz., matter that attracts the spores of fungi and other organic matter, together with inorganic matter always present in the atmosphere. Now such being the quality of the meat when newly slaughtered, and its attraction for infectious matter, what is the conclusion to be arrived at, before the animals leave the grazing or homestead of the farmer? and also during their conveyance to distant markets under the most barbarous modes of conveyance and general management, by railway companies and steamboat companies, that the mind of any intelligent farmer can well imagine in the

present piping times of progress? Even granting that animals were fed on natural food, and healthy in the highest degree before they left the possession of the farmer, the treatment they receive before being slaughtered is such as to render their organism attractive to contagious matter, which would be repulsive under a rational system of marketing; while abnormally-fed animals under such treatment cannot be otherwise than what they are—*subjects purposely prepared to catch contagion from every point of the compass!*

No. II.

Our last article was brought to a close just when we had got to the bone of our subject, viz., the cattle disease question from a physiological point of view, in order to determine sanitary means for prevention, or obviating the maladies now experienced; in other words, *How to keep cattle always healthy*. Our observations too were somewhat brief on the chemical questions involved. It was shown, for example, that there existed two forces, the one attractive and the other repulsive; and, although comparatively little was yet known as to the truthfulness of the conclusion in many of its applications to individual cases, it was granted, for the sake of argument, that contagious matter, whether organic or inorganic, was no exception to the general rule. In other words, practically speaking, animals in a delicate or abnormal state of health, from improper food and treatment in marketing, would attract contagious matter from the atmosphere; when those in good health, and under proper management, would escape, owing to their bodies exhibiting a repulsive action on such contagious matter. This was illustrated by various examples, which corroborated the soundness of the general conclusion.

There must, however, be but a very narrow limit in many cases where the repulsive force of the system could continue to ward off contagious matter; because a vitiated atmosphere is of itself an abnormal condition of hygienic circumstances, contrary to the premises involved. Thus the contagious matter, whether taken into the lungs, the stomach, or the circulation through the pores of the skin, produces a twofold effect: First, it occupies the place of health-giving elements, and thus deprives the system of its normal supply and consequent force of vitality; and, second, it adds to the system active chemical agents, which cannot fail to perform their function. Consequently between the two the repulsive force must become weaker and weaker, until the system in some part or other gives way to the opposite force.

Does not this account for the contagious nature of foot-and-mouth disease?—two parts of the system which in marketing are always in a painfully abnormal state, and therefore predisposed as it were to attract and absorb contagious matter of every kind, more especially as a large amount of the excretory matter of the system is thrown off from the feet and lungs, thereby emitting the horribly bad smell which both here, when animals are long on the road or in bad health.

To obviate infection several plans are adopted in medical practice. Thus, matter of a repulsive character is thrown into the system or applied externally; or matter to produce chemical change of the virus taken into the system—matter to throw it off by the excretory functions, &c.

We are purposely avoiding technical details. Cattle in a natural state, when infected by various maladies, are led by instinct to eat certain medical plants, and by such means often cure themselves more speedily and effectually than were they placed under the nostrums too frequently prescribed by veterinarians, as the latter in curing one part often impair the normal function and future health of another. The medicinal properties of many plants have been discovered by observing the use cattle made of them, and the salutary effect they produced in warding off disease, and in effecting a cure where the system had given way to the force of an opposite class of chemical agents. But when cattle are taken possession of by man, and herded under an artificial system, they are subject to the latter in a greater degree, while they are deprived of the former, the natural use of their instinctive organs, to select those sanatory restoratives which nature has abundantly produced for them in their natural pastures. It is an interesting fact, one that has been noticed by most medical botanists, and which never ought to be overlooked in the discussion of our subject, from a chemico-physiological point of view, that

the herbage of natural pastures consumed by our cattle contains a sufficiency of medicinal plants to prevent disease and even cure them of the maladies to which they are liable in the peculiar climate of the district, and that every locality and place upon the surface of the globe, be its latitude what it may, if inhabited by cattle, yields all those sanitary means necessary to preserve them in health: The savage tribes of the human race, that roam in the unclaimed parts of the world, as in America, Africa, &c., have not failed to observe this, and to profit by the instructive lesson taught them by the lower animals. Thus, Mr. Adanson found the natives on the plains of the Senegal, one of the most unhealthy regions of Africa, using the leaves, bark, and fruit of the baobab tree, to prevent the maladies peculiar to that place; and on trying the effects of the same upon himself he preserved his health, when others, who ridiculed the idea of following the example of the natives, fell victims to the deadly nature of the climate.

This brings us to the physiological view of the subject, the natural food of our cattle, and the peculiar function which the medicinal properties of their food perform in the animal economy—properties which abound in all food, but which nevertheless are of a very different quality and selection or kind. In other words, the artificial foods (such as turnips, tares, cabbages, the cultivated grasses, hay, straw, oilcake, &c.) now given to cattle, are all rich in medicinal properties, but such properties differ widely from those of their natural food. Common salt, for example, soda, potash, iron, sulphur, lime, magnesia, &c., are medicinal properties which abound in almost all plants given to cattle; but such are not the only medicinal properties essentially necessary to health. And besides this, such properties not only require to be given in a vegetable or organised form, but they must be given in combination with others, before they can perform their normal function in the animal economy. What the majority of the others are, we do not as yet know. They must, therefore, at present be termed "the unknown properties." Chemistry has many discoveries to make, before we can tell what those unknown properties or proximate principles are, upon which the health of our cattle so much depends.

But although we do not know what are the proximate principles of either the abnormal food we now give our cattle, or those of the natural food they select for themselves when they enjoy the freedom of doing so, yet we do know that there is a wide difference, and that this difference is not in favour of health, but the contrary; nay, much more than this; for we are, as it were, compelled to acknowledge that the artificial and abnormal food now given to cattle is not only deficient of the health-preserving element, but that it contains noxious matter, which, under certain circumstances, may accumulate in the system, and produce maladies of the most fatal kind, and also perhaps attract poisonous matter from the atmosphere; in others again it may attract the spores of those fungi which start into life, assuming a greenish-blue colour to the very bone, in a few hours after the animal is slaughtered! All this is seen, and a great deal more, the moment an intelligent eye is practically cast across the subject under consideration.

To call this successful farming is a perversion of the English language! To complain and grumble that our cattle do not pay for their keep, that they are in bad health, and that we are losing money and the means of doing well, is to accuse Nature while we ourselves are at the same time pleading guilty! But we need not go further in this direction, for Nature will not only defend herself with a retentive hand, but also compel every farmer, English and Continental, to respect Her Laws, and eventually to become loyal subjects to Her Sceptre. This is brief, but a matter of plain fact not subject to controversy.

The key to the tantalising problem is therefore *natural food*. A single sentence to the contrary cannot be raised upon this head; and the greatest difficulty which will be experienced in turning this key in the right direction, so as to open the door and let in good health and out bad, will be the confessional part of the process which farmers have to make as to the present abnormal dietary of their cattle, as formerly stated under a different head. Turnips and oilcake, for example—"ain't that natural food?" for, until they feel experimentally convinced, as it were, that a nega-

tive answer only can be given to this, it is hopeless to expect they will wheel about and proceed in the opposite direction, seeing such a course is, for a time, wholly uphill, and, as yet, untrod.

The remedy, then, is obviously "a stout heart to a steep hill;" and the sooner farmers address themselves to the journey, the better for themselves and their cattle. About this they need not pause long; for the laws of nature, both in the animal and vegetable kingdoms, must be loyally respected by them before they can expect to preserve the health of their live stock, and thus obviate the heavy losses they now experience. The heavy losses, we repeat, thus sustained cannot be much longer borne under the most favourable circumstances that can possibly attend the present practice of stock management. Granting, for example, that foreign cattle were excluded from our markets altogether, what would it avail the British farmer? Comparatively nothing, as has already been shown; for, so long as the cattle in this country are kept upon their present abnormal dietary, it is impossible for them to be otherwise than unhealthy. And this, too, is not the most humiliating view of the subject, for, in a large number of cases, the bad health complained of, has already assumed several types of an hereditary character; so that we are actually breeding diseased stock, whose hereditary maladies may, by assuming new forms, become more and more unhealthy, thus producing unwholesome beef, mutton, and pork, many degrees worse than the abnormal qualities of which the public now justly complain. This is no purposely-drawn picture, but a legitimate conclusion from existing facts, which even the most sceptical cannot deny. Such, then, being the undeniable position of the question, it is certainly high time for intelligent farmers and a thinking public to bestir themselves and join hands in the prosecution of its practical solution, relative to natural food and healthy cattle, and their contraries—abnormal food on the one hand, and diseased beef, mutton, and pork, on the other. Were it the manufacture of an artificial product, as a piece of broadcloth, a machine, or the result of a chemical process, there is not a tyro, in the old world or the new, who would not ridicule the idea as absurd, were anyone to propose a good article from improper and defective raw materials, that are annually getting worse and worse as to quality. And if such is the case in the artificial world, is it not tenfold more absurd in the natural?

In the manufacture of natural productions, farmers and all others ought to conform to Nature's laws. Opinionative experimentalists may entertain this or that notion of their own doings, in turning out huge carcasses of obese beef, mutton, and pork to market; and so long as an unthinking public, guided more by the sounding name of the producer than the reality of his manufacture, is insensible to the fact that such is diseased meat, unfit for human food, being liable to produce disease in those who eat it, they may well boast of their success, in a certain sense, to those who know no better; but when such farming and such obese meat are brought to the bar of practice, and examined in the light of physical truth, success and boasting are excluded, while national loss, shame, and bad health become the order of the day; and humiliating as this may be felt, by all who comprehend the facts of the case, according to their intrinsic merits, on such farming and such obese meat, when removed to a higher tribunal, and examined at the bar of Nature, the only sentence that can be pronounced is tenfold more condemnatory, her laws being violated in a two-fold sense; for as the article manufactured is purposely intended for the food of man, it follows that by giving unnatural food to our cattle, we are not only guilty of lowering their constitutional standard of health and usefulness, but that of our own also; while, instead of pleading guilty, and endeavouring for the future to conform our practice of stock management to "the laws by which the Almighty governs the universe, which is our bounden duty to do," so emphatically pointed out by the late Prince Consort (whose forcible language we quote from one of his public speeches, Birmingham, 22nd November, 1855), we are blaming foreign farmers for all the ill which rebellion to Heaven and earth is thus justly bringing upon our own guilty shoulders!! How then could we conclude otherwise relative to the farmer's problem?

As to the consumers' question, it can hardly be said that they have hitherto given to it a practical consideration from a

physiological point of view. The future, however, will, to those who are spared to hear it, tell a very different tale, for the influence of diseased meat upon the sanitary condition of the community has of late engaged more than an ordinary share of attention. There is, for example, a growing determination in the metropolis to put a stop to the nefarious traffic in diseased meat, at the expense of those who produce and consign it to market. Statute law has been procured from Parliament for this express purpose; and if found defective, more stringent measures will soon be forthcoming to enforce compliance with the sanitary requirements of the people—requirements which have hitherto been ignorantly, it may be, but wantonly trodden under the foot of the British farmer. This may be thought by some of our readers a somewhat severe and uncalled for summary, but it can only be so by those who do not comprehend the unwholesome character of obese meat; or, as is too frequently the case, farmers who do not know what obese cattle and obese meat mean, for we have met with numbers at our Christmas and summer meet-

ings who concluded that obesity was exclusively confined to the extra fat stock exhibited! No such thing; for the very opposite is more frequently the rule than the exception. It has already been stated that obesity is, for example, hereditary; the newly-dropt calf is therefore a diseased animal; consequently if fattened its flesh is diseased meat, and ought by statute law to be prohibited from being sent to the shambles. Under a certain forcing course of management and abnormal food, it has a proneness to "take on and run to fat" (if we may use a popular expression) as it grows up, but under a different dietary and treatment the very opposite of this is experienced; so that when the animal is sent to the shambles it is little better than skin and bone. Now, between these two extremes there is an endless variety of obese meat, and the leanest carcase is perhaps the more unwholesome food and dangerous of the lot, while the animals during their lifetime when lean are more subject to contagion, and the fatal diseases now so loudly complained of in the province, than when in good heart and condition. W. B.

THE NEW MANURES.

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE,"]

The question of manure is always one of the first importance in agriculture. At this time, when we are in a fair way of manuring at least a third of the cultivable land in France, it presents increased interest.

Our readers know that we have always seized with eagerness every symptom of progress which manifests itself. Thus the excellent works of M. Derries, at Nantes; those of M. Robart, who is at this time in Norway, searching for fresh matter to combine with the excellent manure which he manufactures near Paris; the efforts of M. Moesselmann to combine lime with fecal matter; the question of covered manures raised by M. Giot; more recently, the fine manufactory where M. Cochery pulverizes the fossil phosphate of lime from Ardennes—all these have successively occupied our attention. But we have now to introduce to our readers a new guano, upon which we have received from America some interesting information, through an eminent agricultural chemist in New York—Mr. Maples. We have already had, besides the Peruvian guano, the phosphate guano introduced by Mr. Peter Lawson, and the guano of Baker Isles, introduced by M. Arnoux de Bivibre; but that we are about to mention was discovered at Swan Island, in the Gulf of Mexico. We have been told that this guano will soon be brought to France; and the interest of the question induces us to lay before our readers a translation of the papers sent by Mr. Maples. We shall watch with some curiosity how questions are solved in America, which have been the subjects of so much discussion amongst European agriculturists.

We shall first give the translation of a paper in which Mr. Maples points out the course to be adopted, in order to render exhausted soils fully fertile:

"The term of 'ruined' or 'exhausted soil' is very generally used, and yet some arable soils are never exhausted. Every soil which has at one time been fertile, is susceptible of becoming so again, all that is wanted to make it so being the addition of a very small quantity of already-compounded manure, and leave to the farmers the care of changing the condition of the constituent elements of the soil, so that it may constantly present conditions analogous to those which Nature always supplies in fertile soil.

"All soils are composed of the detritus of rocks, rendered very fine by different operations of Nature. We only find there the constituent parts of rocks, and the other deposits which may proceed from the atmosphere under peculiar circumstances. Thus, carbon proceeding from the decomposition of carbonic acid, is solidified by the decomposition of the carbonic acid taken into the atmosphere, with which it is mixed, and in which it holds itself suspended.

"Yet neither the presence in the soil of all these simple bodies necessary for vegetable life, nor even the presence of all the simple bodies of nature, is sufficient to ensure the growth of plants. These simple bodies must be found in a

certain condition before vegetation can thrive on them. When portions of the crust of the earth, known under the name of soils, have appeared several times in the vegetable forms, and have been rendered many times to the land, they acquire the faculty of forming the constituent parts of the vegetables which men and animals require for their nourishment. When these parts are raised from arable land by the succession of crops, it ceases to be fertile until fresh parts experience a progressive modification, under the influence of the same means or some other analogous process.

"In fact, every chemist may ascertain, by analyzing the constituent parts of different soils, that the materials of the most sterile are the same as those of fertile soils, the difference being only the state in which they are found.

"All soils, from the surface of the earth to the rocks yet untouched, upon which rest the stratified and commercial earths, contain the constituent elements of plants. We cannot say they are exhausted; but they want the progressive modification of part of these constituent elements, by a change of condition, before the plants will be able to absorb them.

"The preceding facts have been established in the clearest manner by comparing the sterile soil of the valley of Miami (Ohio) with some of the sterile soils from Massachusetts. The only difference is in their state of progression, which neither the chemist nor the microscope can determine. The fertile soil of the valley of Miami is a deposit left by the waters, and of decomposed organic matters. Nothing remained of these organic bodies but the inorganic substances which the incineration had left. Although they were the same as the inorganic substances entering into the constitution of the sterile soils of Massachusetts, they were found in a state altogether different, being susceptible of entering into the composition of the highest order of plants. That same soil transported into Massachusetts rendered the greatest service to vegetation there, because each of its parts had several times passed through organic life in some form, and had favoured by these alternatives the composition and decomposition to which it had been submitted. It is thus with all the inorganic products of Nature, and it is for this reason that the phosphates which are found in organic guanos are of so much value when we use them in the capacity of manure; yet the soils, which are themselves the debris of phosphoric rocks, and which ancient chemists considered as equivalent to the phosphates contained in the excrements of birds, are of no real value unless they have been absorbed during a series of ages by inferior plants deposited in the soil after having been submitted to decomposition and brought into the state of the phosphates which form part of the food of birds. For this reason, the organic guanos of Swan Island, which American farmers have used for a long time, and which the French farmers will soon use, are capable of fertilizing the most sterile soils; whilst phosphates which

are found near Dover at New Jersey, and which are themselves the debris of chlorophites rocks, contain several times the quantity of phosphates which are sufficient to render them fertile if they were reduced to a suitable state.

"This new principle will produce quite a revolution in French agriculture. The cultivator may now learn that the value of stable dung proceeds from the inorganic matter which it contains in a particular state, and not from the quantity of ammonia which is found there, as some have announced at different times in a very persevering manner. It is now proved in the clearest manner that every soil properly prepared, containing the constituent elements in a suitable state and in sufficient quantity for the crop intended to be gathered, is susceptible of receiving from the atmosphere alone all the ammonia requisite for giving to water the property of dissolving the quantity of vegetable aliments, this being the only use of ammonia in improving land.

"When inorganic matters, improved like those which are found in the guano of Swan Island, enter into the composition of a soil to which has probably been added its proper particles ameliorated, they do not limit themselves to furnish the suitable aliments to plants: they give again the means for favouring an action *aut generis*, which will convert the superficial part of the soil into soluble substances for the plants. We see effects analogous to this when the potash and other alkalies of the soil render the silica soluble, in order that it may coat the surface of straw. Nevertheless, corn grown in the midst of silica would fail in having its stalks coated with it unless a certain quantity of alkali rendered the substance soluble, and thus enabled the plants to absorb it.

"On farms in the United States, where the Swan Island guano has been used, it is not only the crops that have been improved and soils rendered permanently more active, but the quantities of phosphates and other salts that the crops contain are such that the cattle cease to be attacked by a malady known under the name of *bone disease*, and the cow is enabled to give to the calf she suckles the quantity of lime necessary for its body. In farms where there is a lack of phosphate, it often happens that the female animals devour bones, and eat bone-dust when it is given to them with as much avidity as if it were salt. But after the use of organic guano, which contains mineral substances in a suitable form for the animal, the difficulty ceases, and there is no longer need for either bone dust or any other immediate remedy.

"Even the carbonate of lime contained in Swan Island guano is of a better kind, because its origin is similar to that we find in France in bird's food, and far superior to the ordinary carbonate of lime in France or England. These limes present differences which cannot be discovered by analysis when we compare them with those out of rocks found in other countries where beds of carbonate of lime exist equally. At Winchester, in the State of New York, the farmers calcine their carbonate of lime and transform it into caustic lime; they then expose it to the air for a whole season in order to transform it again into carbonate of lime, and apply it to the soil in a proportion varying from 20 to 25 hectolitres per hectare. By the chemical power of the carbonate the substances contained in the soil are decomposed, which the plants are enabled to eliminate from the inorganic elements. Seeing that crops were improved by this method of procedure, agriculturists thought that lime was the direct food of plants, and in certain instances they applied it in enormous quantities, such as a thousand hecto. per hectare, thus rendering the soil sterile for a long series of years. From whence proceeds this result? Is it because the carbonates of lime prepared in this manner are formed in the same manner as those known in Europe under the name of lime?

"These 1,000 hecto. form less than 2 per cent. of the weight of the soil at a depth of thirty centimetres, yet it is exhausted; whilst the plains of Athens, and many farms situated in the chalky parts of England, contain nearly 40 per cent. of carbonate of lime. From whence arises this difference? Simply that the European limes are of organic origin. The debris of crops decomposed on the surface of the continents of Europe and America, have abandoned the lime they contained. Other portions have been carried into the ocean by the help of rivers and tides, contributing to life perhaps a million times, having appeared in the skeletons of fish, the shells of molluscs, and probably in the habitations constructed by serals. The movements of the soil raised them to the surface of the earth.

"Thus many of the European limes are fossiliferous or coralline from their formation, and consequently superior to those of other kinds; and for this reason the sands formed from crushed corals, those of Paidstown and others, are known to possess such highly fertilizing powers, even upon soils composed of the debris of chalk rocks.

"We cannot, therefore, tell the comparative value of guanos by analysis, without first knowing whether they are of organic origin. Many guanos introduced into market are of little use, though chemical analysis proves their composition to be good. A single ton of Swan Island guano, even in cases where the great mass of its ammonia has been drawn off by rains, possesses a fertilizing power greater than many times its weight of Estremadura phosphoric rocks reduced to powder, rocks from the American deposits, guano in rocks known under the name of Sombrero, or than all the volcanic phosphates, numbers of which are sold sometimes under the name of guanos, sometimes as superphosphates.

"We believe the introduction of Swan Island guano will be of the greatest benefit to European farmers, supplying them with the only means of replacing the inorganic elements taken from their fields with their crops."

We shall not stop to discuss the apparent merits of the note we have read, but we must say some of it appears to us very true, and has besides been already fully established by our own researches, particularly that which concerns the necessity of an intimate mixture of the different organic matters or salines with phosphate of lime. We shall now give the translation of an estimate of the comparative value of different manures, sent to us by Mr. Maples, which agrees in several points with our opinions:

"There are two different classes of guanos upon our market; the first (of which we may take Peruvian guano as a type) is best known to the public. They are composed for the most part of the excrements of birds, and contain a large quantity of different species of mineral substances. They are collected in localities where rain is scarce, and contain a large quantity of ammonia. It is in this class that we must place guanos called Swan Island guanos, which contain the same constituent or organic matters as the Peruvian guanos, but a smaller quantity of ammonia, and consequently a much greater proportion of inorganic matters. Since the fact has been established that some soils totally disintegrated may receive from the atmosphere all the ammonia that they require, this latter class of guano has become of very great use in agriculture. This class of guanos, which comprises, as we have said, at once the Peruvian and Swan Island guanos, are of great value; but the first tends to exhaust the soil of the disintegrated mineral substances which it contains, on account of the useless excess of ammonia; the second, on the contrary, gives the nourishment in a proper condition for sustaining vegetation without depriving the soil of its provision of assimilable substances.

"Another class of guano possessing less value, and certainly not paying the price of transport and manipulation, is that which is obtained by crushing rocks containing phosphorus. Amongst them we find the phosphoric rocks of Estremadura, and the chlorophite rocks of Dover (New Jersey), and Crown Point (Lake Champlain). The two last contain 50 per cent. at least of phosphate of lime, but in a primitive state, and cannot be absorbed by the roots of plants. Even when we take the precaution of treating them with sulphuric acid, they cannot form a superphosphate capable of entering into organic life by its absorbent power and other forces inherent in the roots of plants. Probably guanos of volcanic origin are those which possess the least value of any in that class of useless guanos which are sold to us in large quantities under different names. Some of them are covered by a thin layer of the excrements of birds spread over their surface, so that it has given a false reputation to the mass which has been sold under that name. Although different specimens of them resemble each other analytically, we must not conclude them to be equally assimilable, because chemistry only takes account of the quality of the substances of which they are composed.

"We think the following considerations completely elucidate the facts stated above: We contend that the sixty-four simple bodies, which form the elements of all things, and which all proceed from the soil, where they commenced by being hidden, exist in the soil under different states. Soils are formed by the debris of rocks, and those of recent for-

mation are incapable of assisting to maintain vegetable life except in its most elementary forms, such as lichens, mosses, &c., &c. These plants, which we see pushing themselves over the surface of the naked rocks, receive the simple bodies which enter into their organism, and which we shall find in a primitive state, if we reduce them to ashes. When the lichens and mosses decay, their mineral elements are given to the soil in a state more favourable to ulterior incorporation, and in their turn can enter into the composition of a higher class of plants, which are ultimately themselves decomposed. Again, these plants leave the elements of which they are composed in a superior state to that in which they received them; and thus the result is, these elements improve themselves from time to time, till they become capable of being received into animal life; consequently we find in man nearly all the simple bodies. If it were even possible to nourish a being, whose organism is as complicated as that of man, with substances in their primitive state, it could not appropriate them. For instance, suppose a man could swallow powdered felspar containing 70 per cent. of potash, we should find the whole of the latter substance in his excrements, and not one atom would have entered into the construction of his organs. It could not be otherwise, though all the potash we find in man comes from felspathic rocks. But this potash has run through a species of gradual revolution during the development of organic life, until it was brought into a suitable state to become part of our bodies. The same may be said of every primitive matter that we find in nature. Every plant may be considered as representing a whole, in which the organic matter exercises new functions which did not belong to it before, and which are developed by the new situation in which they are placed. It is in virtue of these principles that we think the analysis of a soil is useless to farmers if it does not establish a distinction relative to the state in which the primitive matters that compose it are found. In fact, an analysis of that kind only points out to him all that a field is capable of yielding to vegetable life for an indefinite period, but giving him no means of judging the proportion suitable to a state in which it can be incorporated in his crops. We have been led to think that the ashes of plants of a superior order, or the products of their decomposition, are much more valuable than the same ingredients under the form of primitive matter. These opinions have been opposed by some critics, but we are happy to say that the whole tendency of scientific minds is in favour of it, as we shall proceed to show.

"We have equally maintained that the manipulations to which the soil is submitted in a regular way, have the effect of improving inorganic matter, and rendering it capable of being admitted to figure in the interior of plants. This result proceeds partly from the very large quantity of vegetable life produced, and consequently the increase of the mass of decomposed roots in the soil; but it applies equally to the chemical changes occurring directly in the soil, from the greater circulation of the atmosphere. We also believe that the opinions of Liebig relative to the effects of ammonia and other azote components are correct, and that the principal use of ammonia spread on the soil is, to render the water capable of dissolving a greater quantity of inorganic matters, in order to put these substances into a suitable state to test the chemical modifications which render them apt to contribute to the nutrition of plants.

"The addition of large quantities of ammonia in the soil only serves really to exhaust its provision of mineral matter prepared for absorption.

"The only difference existing between the opinion of Liebig and ours is, that we think the exhaustion of a soil cannot take place in the sense generally understood by the term. If an excess of ammoniacal matter be presented to the soil, it produces a more rapid exhaustion of the mineral substances prepared for absorption, so that the soil becomes gradually sterile. Nevertheless, the sterile soil may contain a mass of inorganic matter very nearly inexhaustible, and in time the operation of the laws of nature may restore to the soil the element of fertility. But with the aim which we now have in view, we only propose to establish one question—that, for the most part, the inorganic matter of soils is quite sufficient for thousands of crops, and only require to be submitted to a progressive action before becoming incorporated. The following facts will, we think, suffice to prove what we state:—

"The quantity, in kilogrammes, of mineral matter raised by a crop of wheat cut from one hectare is as follows:—

	Grain.	Straw.	Total.
Silica	1,375	178,310	179,685
Potash	13,125	31,925	45,050
Phosphoric acid	22,000	18,175	40,175
Lime	1,485	16,800	17,785
Magnesia	5,310	7,125	12,435
Sulphuric acid.....	0,145	10,125	10,370
Soda.....	1,685	1,570	3,255
Peroxide of iron and wastes ..	0,350	2,310	2,660
Chloride of sodium.....	0,052	0,825	0,677
	45,527	266,465	311,992

"We see that 312 kilogrammes of inorganic matter are sufficient for the grain and straw of an ordinary crop, and that of that mass 266 kilogrammes belong to the straw, and 46 to the grain. Our supposition is based upon the farmer selling the straw; but if we restore the straw to the soil, so as to render to the earth that portion of inorganic substances which enter into its composition, by frequent manipulations, and the roots which always remain in the soil, it will suffice to support the land without the aid of other manures. But for the end we have in view, we must suppose that all the products are raised. Let us see then what are the elements contained in a vegetable earth, an ordinary loam 25 centimetres deep, composed of 80 per cent. sand or silica.

	Kilos.	Crops.
Silica	3,303,263	sufficient for 144,444
Potash	32,503	" 2,484
Phosphoric acid....	15,512	" 755
Lime	53,087	" 35,388
Magnesia	45,737	" 8,555
Sulphuric acid	3,675	" 26,222
Soda	6,125	" 37,777
Peroxide of iron....	138,821	" 396,666
Chloride of sodium..	traces	many

"Who can read the preceding figures without remaining convinced that it is not the want of suitable mineral matter that hinders the growth of corn, but simply the fact that these mineral matters are not in a right state for entering into the composition of the crops? If we use fermentable manures, we increase the power which water possesses, of dissolving mineral matters. We add, besides, inorganic substances of the same nature, those which enter into the composition of manures, and which are in a suitable state for assimilation. If we suppose a soil possessing an inexhaustible provision of the elements of wheat, it will only require to be fallow for a time sufficient to bring all these elements into a suitable state for assimilation. A continued addition of ammonia, without any other species of manure by way of improving the soil, would only serve to exhaust it, and instead of increasing the weight of crops, would diminish them until the land would become sterile. That would not proceed from raising the mineral matters from the soil, but simply through the removal of the ameliorated part of the whole parties of these substances, which may still appear in the wheat. Advocates of the theory of ammonia adopt our views, to the great chagrin of many of the farmers. Some kitchen-gardeners of Long Island (New York) could produce good crops with 200 kilogrammes of Peruvian guano: now they are obliged to use 1,300 to produce the same effect. If they continue thus blindly to follow this course, using ammoniacal manures without at the same time employing the aid of subsoil-ploughs, they will find their land exhausted before the end of this century.

"The experiments made of cultivating wheat upon the Loos-Weodon system have sufficiently proved the truth of our theory. We think the following propositions will suffice to show this:

"When a soil is cultivated deep enough to allow the atmosphere to penetrate through its particles, the transference of these particles into ameliorated elements will always effect itself.

"Drainage and subsoil-ploughs are the most rapid and efficacious means of producing this effect. The only value of farm dung and other manures proceeds from the mineral matters that are enclosed in them, and not in the ammonia which they contain. The presence of that substance only

serves to render the water a more energetic dissolvent of inorganic matters, and it is of great use in accelerating the amelioration of the elements of the soil. As not one atom of ammonia proceeding from the decomposition of the soil is lost, the results of putrefaction must preserve a quantity of gas in the atmosphere sufficient to give water the property of dissolving the inorganic matters, so that it may serve as a vehicle to conduct these matters to the roots of plants.

"The addition of an excessive quantity of ammonia to a soil enables the farmer to supply himself with a quantity of *ammoniated* substances more rapidly than the land can bear, consequently it gets exhausted, and remains relatively of no value for a time more or less long. But the efforts of natural agents suffice at the end of a certain time to render a soil, productive without progressively ameliorating the elements which compose it."

We find Mr. Maples contests the opinion of the English upon superphosphates obtained by the use of sulphuric acid. We shall revert to this subject on a future occasion.

Upon the constitution of Swan Island guano, of which we have not yet seen a sample, and consequently know nothing ourselves, we give the following documents:

"To the President of the Farmer's Club of the American Institute: The Committee nominated by the Farmer's Club of the American Institute, for the purpose of inspecting the guano isles belonging to the New York Company, have the honour of presenting the subjoined report:

"The Committee have examined the titles of the Company, and find that they possess more than three million tons of organic guano in Swan Island, Antilles Ses. This guano has been analyzed by Dr. James R. Chelton, M. Poble, and other chemists, who state that it proceeds from the excrements of birds, and that it is of a quality very much wanted, since the exhaustion of so many beds of bird guano in the islands of the Pacific. We think the discovery of this guano will put a stop to the exorbitant demands of the Peruvian Government for the bird guano from Chincha Isles, which is the only true kind to be obtained now, as that from the neighbouring isles in the Gulf of California, belonging to the Mexican Company, are nearly exhausted.

"The farmers in the United States have been deceived in a most scandalous manner by the proprietors of deposits of volcanic and mineral guanos, &c., which are of very little value compared with the organic guanos produced by an accumulation of birds' excrements.

"Several of our commissioners have had occasion to meet Mr. Thomas P. Morgan, and have been convinced by his conversation that Swan Isle is easily reached, and the guano it contains can be brought to New York at a freight varying from 25 to 35 fr. per ton. Mr. Morgan mentioned all the facts relative to the quantity of birds' dung he found accumulated there, the species of birds habitually frequenting that isle, their habits, &c.

"He stated that nearly the whole of this guano contains a large quantity of phosphate, which may be estimated at 67 per cent. However, the proportion is less in guano obtained from the neighbourhood of the Meridional shores, because that substance is mixed with sands which have been carried by winds blowing in the direction of the sea.

"Although the Company felt bound to take the specimens under these unfavourable circumstances, that is to say, mixed with coral sands, analysis has given in one case at least 41½ per cent. true bone phosphate. That is what is stated in an analysis made by Dr. Chelton and M. Poble. The other parts of Swan Island are entirely sheltered from shore sand, and that portion where the mixture has taken place is precisely in the bay where the Company has constructed their docks.

"Your committee think that the certificates of farmers who have used the guano is the best proof which can be given of its qualities. These prove that it must be a very useful manure. At this time, when farmers are so convinced of the necessity of increasing the quantity of manures, the discovery of these deposits of guano is an event which the whole country should rejoice in.

"(Signed) J. MAPLES, President.
"E. W. PORDEN.
"F. BERLI.

"New York, April, 1862."

"Office of the Laboratory of M. R. Chelton & Co.,
"73, Prince-street.

"We have analysed a sample of Swan Island guano for the New York Guano Company, and find the following results:—

Phosphate of lime	41.50
Carbonate of lime	12.17
Organic matter.....	13.30
Chloride of sodium and sulphate of soda ..	0.50
Sand and other earthy matters	26.00
Water and loss.....	6.53
	100.00

"(Signed) R. CHELTON, Analytical Chemist.

"New York, Dec. 25th, 1862."

"The true guano is a residu resulting from the excrements and bones of birds, &c., more or less altered according to circumstances, such as heat, rain, &c.

"Many phosphoric rocks and volcanic products containing phosphate of lime are received under the name of guano; but the phosphate of lime proceeding from the decomposition of animal organisms possess a value far greater than that derived from rocks or volcanic products.

"We have recently analysed the Swan Island guano which you mentioned to us, and think it is derived from the excrements of birds mixed with sand. This sand may have been carried there by the winds from the neighbouring shores while the guano was accumulating.

"I have the honour to be, &c.,
New York, Dec. 24, 1862. "J. B. CHELTON."

We have been visiting the quarries in Ardennes, which will from this time be worked up on as vast a scale as the beds of fossil phosphate of lime, since we have seen more than 150 men at work in M. Coxhery's factory. France begins now to seek to draw part of the fertilizing matters which its soil presents to it. A new foreign manure will always be well received, as the wants of agriculture are enormous when it arrives at the maximum of production. J. A. BARRAL.

ANNALS OF STEAM CULTURE.

If ever any county was more in need than another of steam cultivation, it is Essex; and yet in Essex the manufacturers of steam machinery have made least way. The great difficulties in their path appear to be the lamentable want of drainage—the ridge and furrow system, which is treated as indispensable, and the small fields with irregular boundaries.

To a certain extent, I may say to a very great extent, there is a lively prejudice against drainage; but in some parts—particularly, for instance, in the south-east of Essex, I find that, until a good tenant-right law gives security to the tenant for his investment, no great improvement will

ensue in this respect. I have met with gentlemen who, although they approve of drainage, consider that they may pay too dear for providing a quick and safe passage of the rain to the boundary ditches. Drainage, where no tenant-right law exists, is clearly a landlord's question. It is his money that should be invested in the permanent improvement of his estate, and the tenant should only be looked to for annual interest upon the outlay.

On this and other points farmers must make their influence felt with their representatives. That rule which prohibits the discussion of political affairs at most of our agricultural gatherings, is most injurious. It seems to me

that these are the only occasions on which they come together; and, instead of wasting time in hearing a number of complimentary speeches, which generally pass between the chairman and Mr. vice, the clergy, and the lord-lieutenant, it would be far better to elicit good sound weighty expressions of opinion on those measures which are necessary to enable them to ply their business with profit to themselves and the country. Why are these shirked?—none can be more momentous. There are, perhaps, patent reasons why Sir Grouse Woodcock would rather that silence were preserved on the matter of the Game Laws, in the meeting over which he presides; but even his patronage may be purchased at a little too dear a rate.

About a year since I had occasion to call attention to the able manner in which steam was being employed in the tillage operation of the farm by Messrs. Blythe and Squire, near Tilbury. I am now about to describe the change which is being wrought by Fowler's steam-plough upon a large farm, in the parish of Little Stambidge, near Southend, and now in the occupation of Mr. William Allen. This gentleman farms very nearly 3,000 acres in seven different farms, some portion of the land going to form part of those islands created by arms of the river Crouch, which empties itself into the North Sea, on the south-east of the county. The land for the most part is heavy, and ploughed with three horses. The subsoil is nearly in all cases a blue or a yellow clay. Sometimes this adhesive earth is found on the top, alternating with a sand or a gravel. The lighter land produces splendid crops of potatoes, mangolds, &c., and the heavier of wheat and beans.

Mr. Allen has used his steam-tackle with great effect upon Wallace Island, one of those islands mentioned above. The staple there consists of 4 feet of blue clay, which is ploughed with three horses. The land having been reclaimed from the sea, is, as usual, intersected by the winding channels by which the sea-water used to find its way to and from it, when it lay subject to the diurnal overflow. The boundaries being so irregular, a great deal of difficulty is experienced in using the steam-tackle to advantage; but it so chanced that the land here, being of such a kind that it can only be worked at a particular time, the auxiliary force proves most valuable.

It is always now the case that the land destined to grow roots is broken up deeply and cleaned in the autumn, instead as formerly in the spring. The winter aëration and frost are considered equal to a good coat of dung; and the dung which is thus spared is expended with great effect elsewhere. The horses, too, have been released from very hard and wearing work. The number has not been reduced, but a great many breeding mares have been employed, which, lightly worked, prove a source of considerable profit. From May to the 29th of September the steam-engine has been doing the work of 21 horses daily, that is, of seven three-horse teams. Such is Mr. Allen's statement; and he considers this estimate "below the mark." The ploughing has been done at considerable disadvantage, for the land lying 10 feet below high-water level, presents difficulties to the drainer, and renders the existence of stetches and water-furrows not a matter of option. Now stetches are obstacles to the progress of the work; for where they measure 8 feet 3 inches across, and a cultivator which covers 6 feet 3 inches has to make one bont on each stetch, it is clear that 4 feet 6 inches is lost each time; and that instead of ten acres a day the outside cannot be more than seven or eight. Notwithstanding this drawback a good tale of work has been performed, as the following list of details will show, containing as it does the result of 103 days of autumnal ploughing and cultivation:—

GRUBBING.			
Acres.	No. of Workings.	Depth in inches.	Acres.
26	Twice	10 after wheat for roots	52
18	Twice	9 after wheat for mangolds	36
25	Twice	9 for fallow	50
11	Twice	11 summer fallow	22
15	Twice	11 after coriander seed for summer fallow	30
14	Twice	11 after wheat for mangold	28
26	Once	14 after wheat	26
16	Twice	11 ditto	32
6	Twice	11 after tares	12
7	Once	11 after wheat for brown mustard	7
15	Twice	11 after trifolium for swedes	30
20	Twice	11 after trifolium for cole-seed	40
11	Once	11 after tares for hay, for wheat	11
16	Once	11 ditto	16
16	Once	11 after peas for wheat	16
26	Once	11 ditto	26
19	Once	11 after seed tares for oats	19
13	Once	10 after white mustard for mustard	13
24	Once	10 ditto	24
PLOUGHING.			
15	Once	8 for swedes	15
22	Once	8 for coleseed	22
10	Once	(dug) 8 for wheat	10
20	Once	(dug) 8 for barley	20
18	Once	(dug) 8 for wheat	18
20	Once	10 for wheat	20
10	Once	9 for roots	10

600

Previous to this, 650 acres were ploughed and cultivated, and, strange to say, without one rupture of the rope; which, when I saw it, looked certainly as though it would last another season. It was about one-third worn only. The severity of the strain put upon it can be imagined when I say that not only has the anchor been pulled from its track, but the heavy 14-horse power engine has been dragged aside also, and that more than once.

The expenses of working and repairs are as follows:

Labour, fuel, and oil, 103 days at 3s.	£169 19 0
Repairs and rope for one year	50 0 0
10 per cent. on value for wear and tear,	
and 5 per cent. for interest on money	120 0 0
	£339 19 0

Taking 600 acres to represent the work done, 11s. 3d. per acre will represent the cost of it. This at first sight looks high, but then we must bear in mind what sort of work has been done, and how, owing to the depth and superiority of the tillage by steam, the number of these operations has been reduced, compared with the old standard. Let us remember the 10, 11, and 14-inch work: let us also remember that, by means of steam, several similar feats have been accomplished to the following: A field of 13 acres, after wheat—one mass of couch-grass: under horse culture a dead fallow would have been inevitable here, which would have cost six or seven two and three-horse ploughings. Instead of this it was broken up deeply immediately after the wheat was removed, again stirred and drag-harrowed, and cleared by horses. It was then

sown with oats and seeded, the seeds being now perfectly clean and thriving. Mr. Allen considers in this case he has gained the oat crop clear. It must not be forgotten, also, that the engine has been employed during the year to thrash 1,200 qrs. of wheat, peas, and white mustard; a fact that shows that I have not been right in charging the whole year's interest on the tillage.

The farm upon which Mr. Allen resides is in the parish of Little Stanbridge; and the fine old Hall, containing within its enclosures the little toy-like-looking church with wooden spire, appears to constitute the village. Much of the land he occupies belongs to him, but this farm he rents of a neighbour, who likewise farms. On approaching the neighbour's farm, before I came to Stanbridge, I concluded from the size of the fields and the absence of hedge-row timber that it was Mr. Allen's, laid out specially for steam. This, however, was a mistake; and I was not a little surprised when I found that by one who evidently so well appreciated the advantage of dealing with land in large areas, needless obstacles were thrown in the way of an enterprising tenant who aimed at the same result. I mention an instance which, though by no means without its counterparts in other neighbourhoods, seems to be needlessly vexatious to a man who is expending his capital with a lavish hand in the improvement of the property. There are three fields lying together—a 12-acre and a 24-acre field at either end, and a little field of six acres, with about two or three pounds' worth of timber in the hedge-rows, to divide them. They are all arable: together they would make a fine 40-acre plot, and yet permission to throw them into one is withheld. The six acres must of course be ploughed by horse, and the fields on either side of it are each tilled at more expense than they would be were the intervening hedges levelled. Indeed I will undertake to say that the ploughing of the 40 acres together would not cost more than the 12 and the 24-acre together do now. In other farms occupied by Mr. Allen, such barriers to progress are readily removed, and as free a course is given to the steam plough as to the celebrated Scratton hounds, both being patronised by the same admired and respected lover of the chase.

The following are a few particulars concerning the workings of certain fields:

Twenty acres, broken up after peas 7 inches deep, struck with horse plough, and harrowed down with horses: here the stetches were done away with for the first time—an experiment which is watched by neighbours with the hope, I would almost say, so natural to the prophets of ill. The plough was at work, and turning four furrows with great exactitude. The old bailiff owned that horses could do nothing like it, for regularity in depth. Including mowings, the piece would take 8½ days. Great attention was paid to support the slack rope. Ten acres also treated experimentally by the abandonment of the stetch system, after wheat, ploughed 8 inches deep, drained.

Forty-eight acres, formerly comprised of two fields of 18 acres and one of 12, prepared for wheat. Twenty acres, one year's grass ley, fed off and dug (by steam) 9 inches, lay from July to September without being touched, weather killed all the weeds, subsequently harrowed, and horse-ploughed on the stetch, and drilled with wheat. A fine tilth and clean, undrained. Mineral-manured with chalk from Greys.

Mr. Allen uses a great quantity of London dung, which comes by water to within a mile of his farm, and his crops show in a very marked manner the effects of this stimulus combined with deep culture. There is yet one great obstacle—the presence of water. It has been again and again shown, and by no one more powerfully than by Mr. J. B. Spearing, that temperature is one element requisite to the fertility of land. The best means of heightening

its temperature is by lowering "the sock," which can only be done by effective drainage. In a situation such as I have described Mr. Allen's to be—that is, 10 feet below high-water mark—it must be supposed that the outfall is not the best in the world; but, beyond this, the custom of the country, or the seigniorial conditions, I forget which, have imposed other difficulties in the way of thorough drainage. The landlord will supply pipes, which the tenant may employ as he pleases, on condition that he covers them with three inches of cockle shells—a useless addition, which increases what without it is a sufficiently expensive operation, by about £1 an acre. Such an arbitrary condition should be at once removed; and where tenants withhold from risking their own capital in drainage, by reason of their possessing no lease, and no tenant-right guarantee that unexhausted improvements will be treated with compensation, the landlord will certainly best secure his own interest by having the land well drained at his own cost, and charging the tenant a reasonable per-centage on the outlay.

The acquirement of steam power to help him in the cultivation of this strong land has afforded the utmost satisfaction to Mr. Allen. His expenses have been reduced, his yearly area of cropping has been enlarged, and his annual returns have been increased.

The ignorance displayed by a recent correspondent of the *Times* would receive its best rebuke were the writer to make a visit to Stanbridge. So far from steam culture having proved a failure there, Mr. Allen is thinking of employing two sets of steam apparatus—not of abandoning the one he has already; and certainly no one who saw so much of him as I did could leave his hospitable roof with the conviction that steam was regarded in any light than as a simple means of enlarging his profits.

In this world man is much given to depend upon precedent. We all look for the footsteps before us, except certain brave and independent spirits, who create the precedents which serve as infallible guides to those who are content to follow. They, looking to the point they desire to reach, make straight towards it, undisturbed by any footpaths that may happen to cross the line they have decided upon. Men are as obsequious to rule and traditional procedure in agriculture as most other things. The landowner seeks as pertinaciously for his precedent as the tenant-farmer—nay, more so; and, as a rule, neither will move without it. We owe a debt of thanks, therefore, to those who, in the interest of progress, have the manliness to announce a new way, and thus occasionally to break the martinet spell which encircles the busy multitude, and makes them governable. Were it not for such occurrences we should be at a dead-lock, like the Chinese, who enjoyed their present degree of civilization when our rude ancestry of the woods and caves were chewing earth-nuts, and rendering their bodies horrible for war, with vegetable juices.

In England we have reason to think with pride of many an original thinker, who, when the old methods were becoming inefficient, pointed out the defect, and helped to create new ones better adapted to the necessities of the times. As regards agriculture, the present state of the land, the crops, the cattle, and the work-people, as compared with what they were one hundred years ago, testify to the bold creation of a rapid succession of new precedents, having no likeness to anything recorded in those early times. Ten years ago was created that rule which recognizes steam as the necessary substitute for horse-power in the field, and which farmers generally are now preparing to follow. It is hard to say what individual should have the credit of first striking out this original idea; but I rather think that, although several mechanics set about devising the means of rendering steam as

amenable to rule for tillage operations as horses, the demand for a motive power better fitted to their purpose than that derived from animal muscle first set them upon devising the beautiful machinery now used to increase the produce of the country, and, at the same time, to diminish the expenses of soil-culture. Although the lead is given, and the rule is laid down—although steam cultivation is proved to be equal to the prophecy which theory ventured concerning its virtues, there is a certain class of men not so immediately benefited by the adoption of the new example as those to whom an immediate recurrence to it appears to be pre-eminently essential. With the old appliances, the tenant-farmer knows that he cannot raise wheat at 4s. a bushel, and so meet the foreign produce in the British market on equal terms. Steam, especially on some soils, may enable him to do this, and more, and he is therefore anxiously looking to its employment. His power to adopt it successfully depends upon the proprietor of whom he rents the land; for with small enclosures, irregular boundaries, and antiquated covenants, he could only work a steam plough at a loss. The proprietor, whose necessity for change is not so immediate and obvious, is staggered when applied to, to remove, or allow to be removed, the field boundary lines, which are now as they are seen to have been on the old tithe map which rots in the parish vestry. As no such thing ever did occur, the question is whether it ever should or could occur. Tradition in this case opposes reason with a fearless front, and the country is called upon to purchase from other nations every year much corn that could be produced at home. In answer to the appeal, "This is a landlord's question," it is said, "Steam cultivation will come without us"; and so on the part of the landlords there appears to be a check given to the tenant-farmers in their desire to make their supply equal to the demand.

From the slavish adherence to precedent, however, I can happily quote several exceptions, like those of the Earl St. Germans, who has given Mr. Ruck permission to remodel his farm, and lay it out in blocks, intersected by hard engine roads. His example I have already quoted. I am now about to quote another, which will go farther to show how much benefit may be derived from preparing farms for steam cultivation, both by the landlord and the tenant, and with what perfect safety the course may be adopted.

It is necessary, however, that landowners should not only grant permission to their tenantry to remove hedgerows and create hard roads. As a rule those enterprising men who purchase steam tackle have more than enough to do to pay for the tackle the first year. The permission would only avail with tenants who are men of capital. So far as the community of farmers is concerned this must be a proprietors' question. And why not? Where, I should be glad to be told, can he find a better investment for his money than in an improvement, which, if it be stiff clay land, will, in five years, increase its rent by 10s. an acre, and yield him an immediate annual return of 5 or 6 per cent. on the actual sum expended? Better far such good dividends from this source, than from risky speculations on the Stock Exchange, where every man is seeking to find a bigger fool than himself. Mr. Smith, of Woolston, gives a positive case, to show that in consequence of the improved condition of land held by himself, the Parochial Assessment Committee (appointed under 25th and 26th Vict., cap. 103), have "shoved it up 10s. per acre over a very fair rate made sixteen years ago by a gentleman sent down by the Tithe Commissioners to value and assess the tithes of the parish, on which the valuation of the rate was based." And farmers who are ready to pay a fair rate of interest for capital expended by their landlords on such improvements as they deem necessary to profitable farm-

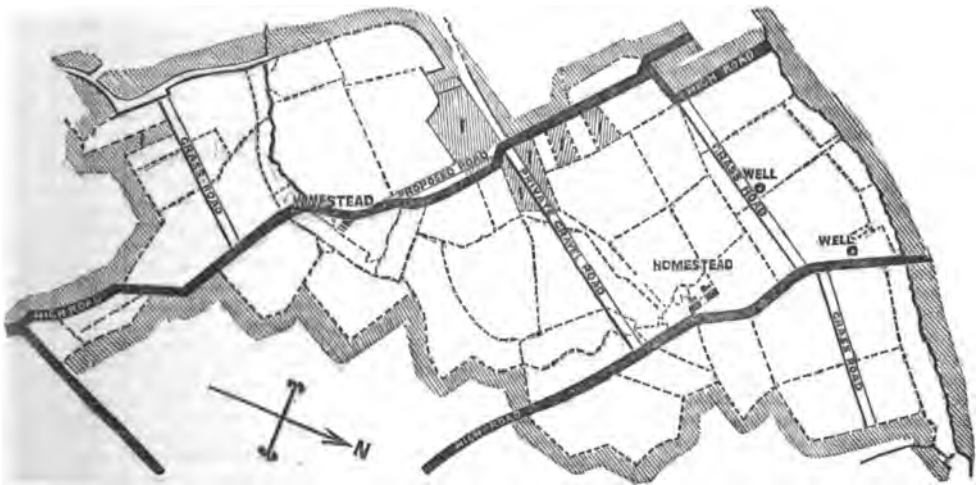
ing, may be met with on every estate. A farm that lies in seven and ten-acre fields cannot be cultivated by steam to advantage. Four or five of these enclosures want throwing into one, and the whole could be dealt with at less expense than two-thirds of the quantity as it now lies. I saw, the other day, two twelve-acre fields separated by a narrow field of six acres; making, by its irregular hedgerow, all three fields most difficult to cultivate. The centre field was ploughed by horses, the other two by steam. The hedge-rows once removed, and there lies a fine manageable plot easy to cultivate; but the landlord says, "No." I suppose he thinks the internal division of the farm as much the subject of entail as the land itself. The truth will penetrate his mind sooner or later, I conjecture, and the more rapidly as the examples of those who compose the van of progress is more widely followed.

As I chance to meet with them, then, I intend to hold up to view these specimens of what may and should be done in order to facilitate the introduction of steam, and give it "a fair field" by the great landed proprietors.

Mr. John Prout, of Blount's Farm, Sawbridgeworth, Herts, purchased the land he now occupies in the autumn of 1861, and has since farmed it. The first thing he did was to order a set of steam apparatus of Mr. Fowler. It was the idea of being one of the first in the field to reap the advantage to be derived from breaking up this heavy clay soil to a great depth, that led him to make the venture. His next care was to remove all obstacles to its successful working. Being his own master, he set about clearing away every internal hedgerow, and every stick of timber which infested them; of filling up the open drains; of draining deeply, and conveying the water by covered ducts to the outfalls; of laying the whole area open, and intersecting it at convenient distances with permanent grass and hard roads; and of sinking wells here and there to receive and reserve the drainage water to feed the engine boiler. Still the boundaries in some cases were far from straight—little bits of his land jutted out into other estates, and other properties jutted into his, and rendered necessary the employment of more horses for the cultivation of odds and ends than he would otherwise have kept. He therefore effected exchanges with the proprietors who surround him, and has now secured a comparatively uniform boundary line. The line was made in some instances by purchase. He originally bought 450 acres; to these he has added 10 by purchase, and to his effective corn-growing area he has added 25 acres which were formerly occupied in growing quick and timber, or in drainage.

The farm in its original state is depicted in the plan at the head of page 129. It lay in a form particularly ill-calculated for successful steam culture. The fields made dark, and marked, I have been purchased, or been squared for the plough by a give-and-take process, as, for instance, that at the south-west extremity of the estate, where Lord Ebury has accommodated the desire of his enterprising neighbour. One of these plots, lying most inconveniently in the very centre of the farm, near the southern homestead, is not here shown. The eastern boundary remains precisely as it was, I believe, and should have been delineated by a continuous rather than a dotted line. The bit of land at the southern extremity of the estate, cut off from the rest by the road, and formerly in three fields, is now thrown into one field, but is cultivated by horse-power. The same may be said of a field to the north-west, and separated by the road. The rest of the land, now that the internal dotted lines representing the hedgerows with their ditches are removed from end to end, and the whole divided by grass and gravel roads into seven plots, is cultivated by steam. The road lettered "Private grass road," which connects the two homesteads, should be Private gravel road. These engine roads are so

PLAN OF MR. PROUT'S FARM.



arranged that the plough working on either side of them has not to run more than 400 yards at a stretch. The supply of water is very well arranged. A brook which is ever running supplies the southern portion of the farm, and wells have been sunk for the supply of the northern; some of them being merely reservoirs to hold the drainage water of certain areas, which is carried into them. These latter are about 17 feet deep, hold about 12,000 gallons of water, and cost £7 each; last year they fed the engine till the middle of May. One, fed by a spring, and worked near the lower high road, to the north, never fails. The whole of the land has been, or is now about to be, thoroughly drained. Some of it had been drained by the former tenant, about 22 inches deep, 16 feet apart, with wood, with the mistaken idea of carrying off the surface water; a field or two, just acquired, and so treated, lies in very narrow stretches, with furrows 40 inches apart. The main water-ways have been widened, deepened, and improved; straight-ways have been substituted for circuitous ones, and those which could be covered up have been.

Now, it is quite certain that whatever might be the capital of a farmer, he would not invest in such works as these upon the property of another, unless he received security of a very exceptional nature. If he neither could, nor by the nature of the law would be justified in doing so, it is clear that the question is a landlord's question. Were all estates of the same dimension as this farm, the process would never be undertaken; but in dealing with thousands, in place of hundreds of acres, the difficulties growing out of interlinking boundary lines are very much reduced. Within the landowner's own domain there would be little difficulty in striking the straight line with even-handed justice, as regards the interests of the various tenants. The rectification of the external boundary line would be another matter; sometimes possible and easy, sometimes expensive or impossible. The removal of hedges, and hedgerow timber, for the purpose of throwing land into large blocks, is a consequence of adopting steam culture, for which many men are unprepared. They talk about the destruction of the picturesque, and with more

reason of the tendency such a practice would have to expose the country to the damaging effects of wind, which is now checked and mitigated in its career. There is something in this objection; but by the formation of sheltering plantations in certain parts of the estate where they may best act as protection against the most prevalent blasts, instead of planting trees all round a field, to sap its nourishment and shade its produce, a course would be adopted more in accordance with the teachings of modern science.

For the sake of showing the benefits of the change, as yet only partially carried out, I propose to mention certain actual results reaped by Mr. Prout.

The soil is a plastic clay, overlying a churlish yellow clay, intermingled with chalk stones. The top soil is pliable, and looks easy to work; but the sticky nature of the subsoil renders it necessary to employ more power than would be expected only to turn a furrow five inches deep. When the estate was in two farms, the number of horses kept was twenty-one. Eight are now kept; but before the squaring of the farm in the manner that I have described took place, a greater number was retained, since many narrow slips running into other properties obliged the owner to have recourse to horse-power, and to keep more cattle than he does now that he has perfected his boundary line. The farm was purchased in Michaelmas, 1861. It was in a fearful state—flooded with water, matted with couch, and so far “run out” as to have produced only twelve bushels of wheat per acre as a parting memento to the outgoing tenant. The work of improvement commenced at once, and the spade and pick soon made way for Fowler's steam plough, which appeared in October of the same year. There was no thought of cropping for the next year. All effort was bent to rid the land of the weeds that were sucking out its vital energies. The land, which never before had been turned up more than four inches deep with three and four horses, at the rate of a mile or a mile-and-a-half an hour—a glistening furrow—slice out from the watery bed—was ripped up, after the springs had been tapped, to a depth of nine inches, and crossed, recrossed, grubbed, and smashed all the winter, spring, and summer through. At

the end of 1862 the apparatus—sometimes ploughing, sometimes subsoiling, sometimes scarifying—had worked 1,487 acres, at a cost, calculating 5 per cent. on £1,065, the outlay for the apparatus, 5 per cent. for maintenance, the absolute cost of repairs, and the depreciation of the rope, which was but half worn, varying from 6s. to 10s. an acre. A calculation was then made to show that, allowing eight horses only to have been disposed of, those eight maintained at a cost of £378 to plough 386 acres 5 inches deep, were substituted by Fowler's tackle at a cost of £458 17s. 8d. to plough 618 acres, 9, 10, and 12 inches deep, and to scarify besides some 608 acres.

It is now about a month since I last went over the farm. Much progress had been made in the interval. The crop had been good, as I saw by the stubble; and the working, which I thought last year was excessive, had rendered the land very clean, and stood, in not a few places, instead of a coat of manure. A piece of land thus treated, and thoroughly out of heart, without manure, bore what was estimated to be 5 qrs. per acre at least, the former crop having only been 1½ qrs. Another piece of 55 acres, similarly worked, was sown with beans, and manured with 3 cwt. of guano only; the crop was good, and the wheat which followed, without manure, was estimated by neighbouring farmers, who said that the experimenter might only expect to see his seed again, at fully 5 qrs. per acre. It is thus the riches, the latent riches of the soil, so well portrayed, at a late meeting of British agriculturists for the promotion of steam cultivation, by Dr. Voelcker, are rendered available. The plan adopted by Mr. Prout is, to secure the seed-furrow being made before the fall of the year for roots and grain, and then nothing remains to be done in the spring but to harrow and drill. If this furrow must be turned after the winter, the land is livery, and makes but a sorry seed-bed, be the harrow-tooth as busy as it may.

I just got in time to see the performance of a splendid piece of work. The land, which had been occupied by a remarkably fine crop of turnips, was being cleared of it. As the roots were carried off, the plough followed, carrying two furrows, and a subsoiler between them. The plough turned a furrow 7 inches deep, the subsoiler stirred below this to a depth of 7 inches, so that the whole was broken up to a depth of 14 inches, and the surface soil was kept on the top. This seed-furrow was for barley. The operation performed with a 14-horse power engine, with 80lbs. steam-pressure, cost £1 per acre, and is surely well worth it. Where will the water stand this winter on that land?

I came to one bit of 30 acres, which had borne barley. Two acres of it had been tilled by horse-power, the rest by steam, all had been treated alike, yet at harvest competent authorities stated that the latter was a better crop by four sacks an acre than the former. The thrashing-machine must prove this point.

I found all the wheat stubbles turned up (130 acres), except what is intended for dead fallow this year, and it is thought wise, for cleansing purposes for a year or two, to retain the dead-fallow system. Those stubbles intended for roots have been subsoiled twelve inches deep. The wheat plant, all on the flat, looking splendid, growing on land which mostly has been subsoiled to a depth of 14 inches.

The engine has been kept constantly at work, weather permitting, every day of the year, in tillage operations, and not about thrashing at all. Had the weather been better more would have been done, and, as it is, a glance at the following table will show that that worthy steam arm has enjoyed no sinecure.

Date.	For what crop.	Nature of work.	Acres.	Depth in inches.
April 8	Wheat	Subsoiling	30	14
"	Roots	Ploughing	27	9
"	Roots	Scarifying	36	14
May 1	Wheat	Subsoiling	26	7
"	Roots	Ploughing	9	9
"	Roots	Scarifying	23	13
"	Wheat	Subsoiling	12	10
"	Roots	Cultivating	25	10
"	Roots	Scarifying & harrowing	25	10
"	Roots	Scarifying	25	10
"	Roots	Cultivating	8	10
"	Roots	Scarifying	16	10
ne 26	Roots	Subsoiling	6	14
"	Roots	Cultivating	3	10
"	Roots	Subsoiling	20	14
"	Roots	Scarifying	34	10
"	Roots	Cultivating	14	10
"	Roots	Ploughing	8	9
July 10	Wheat, &c.	Roots	36	9
"	Roots	Cultivating	56	9
"	Roots	Roots	34	10
"	Roots	Roots	20	10
"	Roots	Scarifying & harrowing	34	8
"	Roots	Cultivating	24	10
"	Roots	Scarifying & harrowing	48	10
"	Roots	Scarifying	24	8
Aug. 7	Roots	Ridging	36	8
"	Roots	Roots	34	8
Sept. 4	Roots	Roots	16	8
"	Roots	Cultivating	30	9
"	Roots	Scarifying & harrowing	15	9
"	Roots	Scarifying	15	9
"	Roots	Subsoiling	21	14
"	Roots	Scarifying & harrowing	22	6
"	Roots	Roots	34	6
"	Roots	Roots	12	6
Oct. 16	Barley	Ploughing	26	9
" 23	Roots	Subsoiling	27	12

From this table we gather that about 900 acres have been worked between April and the 23rd of October; and should anyone interested in these figures wish to know the number of days' work here represented, it may be well for me to add that 3½ acres of subsoiling is a good day's work; of ploughing, 7 to 8 acres; of cultivation, in which process the plough bodies are armed with short breasts, 9 to 10 acres; and of scarifying, 14 acres. Movings are here included; but movements on a farm so laid out form but a nominal element in the calculation. The ridging here performed is done by the removal of the first and third breasts. The work has been done for 6s. to 8s. an acre, taking into account all the items of expense which enter into such a calculation. The cost of rope and repairs is as follows. After the work of 1862 the steel-wire rope was supposed to be half worn out, and a sum consistent with such a state of things was placed against the tillage. In September last it was found necessary to obtain 450 yards of new rope, the old one being equal to perhaps about 500 acres of light scarifying. This would represent a wear of rope expressed by £20 (the new rope having sustained no perceptible wear). The cost of overhauling the engine, and supplying wearing parts to implements, &c., is set down at £52 15s.

It could be wished that the corn were all thrashed and sold. Nothing can be more certain, however, than that the fertility of the land has been much increased; that the

crops have been enlarged beyond the expectations of neighbours, who have been sceptically watching the experiment; and that the farm, when next valued for assessment, will prove the commercial estimate that is put upon the process which has been so ably conducted by Mr. Prout.

AGRICULTURAL LOCOMOTIVE ENGINES ON THE HIGHWAY.

MEETING AT FAVERSHAM, DECEMBER 28, 1863.

A special meeting of the waywardens of the Faversham Highway Board was held, for the purpose of considering a resolution, of which notice had been given at the previous meeting, to the effect that in the opinion of the Board the use of locomotives on the public highways is dangerous and inconvenient to the public, and therefore that an application be made to the Home Secretary, under the powers of the 24th and 25th of Victoria, cap. 70, to prohibit the use of all kinds of locomotives on any highway whatever within the district.

The Rev. G. B. MOORE, Chairman, read the resolution.

The CLERK: In accordance with the instructions of the Board, I forwarded a copy of that resolution to each of the owners of traction engines in this neighbourhood, several of whom, I believe, are now here. I also communicated with Captain Ruxton, who had supplied me with the names of all the persons using traction engines in this district.

Mr. CARTER: At the last meeting I gave notice of my intention to bring forward the resolution just read, as I have felt, from personal experience, that with the present state of our roads they are not in a condition to receive these engines. Our roads, it is well known, are too narrow to allow carriages to pass these engines with safety. As a waywarden, having a seat at this board, I am bound to see that the public are not inconvenienced, which I maintain is the case at present by the use of these engines, as our roads are altogether too narrow to allow them to pass ordinary vehicles with safety. My resolution, therefore, if carried, will remove the responsibility of their use from our shoulders. I consider that there is no necessity for me to any longer take up the time of the meeting, and therefore I will simply propose the resolution of which I have given notice.

Mr. ELEY suggested that it would be desirable to call on the owners of the engines—many of whom were present—to make any remarks they pleased before the Board discussed the matter.

The CHAIRMAN: We can't call on them until you state what you propose to do; I would therefore suggest that the resolution should be duly moved and seconded, after which the owners of the engines could make any explanations they thought proper.

Mr. TWOPENY: Yes, that seems to be the best course.

Mr. JARMAN (who was almost inaudible), said he should second Mr. Carter's resolution, knowing that the use of the locomotives on their roads was attended with great inconvenience.

Mr. JAMES LAKE: As one of the first and oldest of the agriculturists who have used steam in this part of the county, it devolves on me to say a few words against the resolution now proposed. I altogether dispute the conclusions arrived at in respect of the necessity existing for the adoption of the measure proposed. I ask, can they prove one single accident to have occurred from these engines during the five years they have been used here on the roads? If they can't do that, why the whole thing falls to the ground.

Mr. CARTER: Yes I can. There is a case of my own, where one of my horses and a cart leaped over a hedge on the passing of one of these engines.

Mr. LAKE: I submit that although that was an accident, yet it was in no respect a serious one. On the same principle you might put down railways, if you could, because there have been far greater numbers killed on railways while crossing the line, and on other occasions, but yet no attempt has been made to put railways down. I must say I was literally surprised and astonished when I read the terms of the resolution intended to be proposed, and put on my spectacles to ascertain whether I was reading correctly. I say I was really sur-

prised that in this the 19th century any attempt should be made to put down steam engines and steam cultivation, and to put an end to the use of these engines; for, bear this in mind, if your resolution is passed, it will have the effect of entirely putting down steam cultivation in this part of England. Depend upon it the danger from these engines on the roads is more apparent than real. The issue you are called on to decide is none other than this—Shall cultivation by means of steam cease or not? The engines only pass along over the roads at the rate of two miles per hour, and what danger can there be in that? If it is to be insisted on that these engines shall only travel by night, then, I maintain, the danger is much greater at night than by day. If those gentlemen who appear to be so patriotic had clubbed together and bought a steam traction engine for the farmers, they would have done a vast deal more good than they are now doing in trying to put down the use of these engines, and with them steam cultivation. Let us see what is thought of these engines, and what they are doing in other places. I have here a copy of *The Times*, which also contains the account of the fight between King and Heenan. However, I am not going to read that, but something under the head of "Naval and Military Intelligence" (Paragraph read). Now, gentlemen, it has been said that these engines injure the roads, and I own they may do so where they are constantly going backward and forward over the same road; but where they go over roads only about once in six weeks, no injury can arise but what there is ample time to repair.

Mr. CARTER: I happen to know a neighbourhood where these engines go daily. I say candidly that I have no objection to their use on the public roads, but what I say is that our roads are not fit for them, and if you use traction engines you must make up your minds to have your roads widened. At all events, the public cannot say that they are now properly protected, so long as we allow these traction engines to use the roads in their present condition.

Mr. AVELING: I beg to thank you on behalf of the owners of agricultural locomotives working in this district for the consideration you have shown us in requesting our attendance here to-day; and we appreciate this the more when we compare it with the course taken by the authorities in the Ashford district, who, without any notice, applied to Sir George Grey to prohibit these engines from working on any of their roads except between the hours of 10 and 7 at night. I understand that request has been granted, although a locomotive engine had not been seen in the town of Ashford for three years. An entire stop has thus been put, not only to agricultural locomotive engines, but also to ploughing by steam power in that district, as it is impossible to remove the large engines required for this operation by horses, and a very slight experience will convince the most sceptical of the difficulties attending the removal of an engine from a wet field by lamplight, independent of the serious loss which must ensue when the ploughing has been completed, at say, 10 o'clock in the morning; their men must remain idle the rest of the day, as, should they dare only to cross the road on their way to another field before ten o'clock at night, the owner of the engine is liable to be summoned before the magistrates and fined five pounds for the offence. If there be danger in using these engines, daylight must lessen and darkness add to it. As to the roads being too narrow, the engines are not so wide as the thrashing machines they drag behind them, which must still travel the roads if drawn by horses. I am of opinion that, should the present low prices of corn continue, a large portion of the poorer clay lands must go out of cultivation, unless the heavy expenses are reduced. I know what an important item horse form in these expenses,

and the daily increasing difficulty experienced in getting farm servants. The most effective way of reducing these expenses and difficulties is the substitution of steam for horse power; and that this has been accomplished as regards thrashing and cultivation is now generally admitted, and that it can be used economically on the road I propose to show by a comparison of the cost of removing 12 tons of material a distance of ten miles, the waggons returning empty—by

STEAM v. HORSE-POWER, ON THE ROAD.

	Steam.		
	£	s.	d.
Cost of 10-horse power locomotive engine	420	0	0
3 waggons, 6-inch wheels, at £45	135	0	0
	<hr/>		
	£555	0	0
<i>Horse-power.</i>			
Cost of 4 teams of horses and harness.....	560	0	0
Four waggons, at £30	120	0	0
	<hr/>		
	£680	0	0

WORKING EXPENSES PER DAY.

	Steam.		
Coal, 8 cwt., at 1s.	0	8	0
Oil, &c.	0	2	0
Engine-driver	0	5	0
Steersman	0	3	0
One labourer	0	2	6
Wear-and-tear for one day, estimated at 20 per cent. per annum for 250 working days, on £555	0	9	0
Interest on capital for one day, at 5 per cent. per annum, for 250 working days	0	2	3
	<hr/>		
	£1	11	9

Horse-power.

Keep of four teams of horses, including stabling, &c., with wages of eight men, at per day	2	12	0
Wagon grease	0	0	3
Wear-and-tear for one day, estimated at 10 per cent. per annum, for 250 working days, on £680	0	5	5
Interest on capital for one day, at 5 per cent. per annum, for 250 working days	0	2	9
	<hr/>		
	£3	0	5

Difference in favour of steam, per day, £1 8s. 8d.
Total saving per annum of 250 days, £368.

I am quite aware that a strong prejudice exists against steam on the roads. This has mainly arisen from due allowance not having been made for the difference in the effect produced on the horse and driver by the passing of an express train running at forty miles per hour, parallel and close to the road, as is the case for long distances between Sittingbourne and Faversham, and by passing an agricultural locomotive travelling at from two to three miles per hour, and which can be stopped in a minute by holding up the hand, should either the driver or any of his passengers, or the horse, show themselves in the least degree nervous or alarmed. The owners of seventeen of these engines are in attendance here to-day; and if any suggestion can be made which would tend to allay any feeling which may exist against them, I know that it would be cheerfully carried out; and should any case occur where the man working with these engines neglect to do all in their power to assist any one in passing, either by stopping the engine, if required, or by leading horses past, we shall feel much obliged by the report of such case; and we will take steps to prevent a recurrence. Agricultural locomotive engines have now been working successfully in this county for five years. They are rapidly superseding the portable engine; and those farmers who have employed the former will never, unless compelled, return to the latter. The Society of Arts, in their list of premiums for the session of 1863 and 1864, offer "a prize for the production of an efficient agricultural steam engine, capable of use on the farm and of being made available for carrying farm produce and manure to or from railway stations." The judges of engines, in their report of the Worcester meeting of the Royal Agricultural Society, "observe that traction engines useful for agricultural purposes

are now beginning to take an important position; and we recommend that the class be recognised by the Society, by the offering of a sum of money for competition either at the next show or at some convenient previous date." One hundred of these engines have now been manufactured by my firm. They are at work in India, Australia, the West Indies, and in most of the principal countries in Europe. They have been awarded the prize medal of the Great Exhibition, and four first-class foreign prize medals, during the last twelve months. From the foregoing statements it will, I think, be clearly perceived that the want of an engine of this description is universally acknowledged; and I am certain you will agree with me in saying that it would be unwise and impolitic in the extreme to crush an invention which bids fair to prove so beneficial to the agricultural interest, or to place any impediment in the way of its general adoption.

Mr. R. LAKE, after requesting the Deputy Chairman (Mr. Carter) to read the resolution, said: I am perfectly at a loss to understand what can be your object in proposing such a resolution, and I regret excessively that a person in your position, and one so deeply interested in the prosperity of agriculture, can be under such a delusion with regard to this question. It is, I repeat, perfectly astonishing that you, who are so interested in agriculture, could be found to propose such a resolution. You must excuse me, but I cannot help repeating that it does appear to me to be something astounding that a person with your usual common sense should be found proposing such a resolution.

The CHAIRMAN: Excuse me, but I think you are wandering from the resolution and the question before us.

Mr. LAKE (continuing): I certainly thought from the conversation I had with you at Canterbury, that your views were totally opposed to this resolution. If this resolution should be allowed to pass, and I don't for one moment believe it will pass, it will be the means of inflicting the greatest possible mischief to this neighbourhood. These locomotives can't, I contend, be anything like so dangerous as the trains on the railway, for there the danger is something awful. It is to me astounding that such a resolution should be agreed to, and I cannot bring myself to believe that it will.

Mr. CARTER: I maintain that I am as much interested in this as Mr. Lake. When I was sent here a waywarden I was so sent to represent those who sent me. Several gentlemen maintain that these engines are dangerous, and therefore I felt it to be my duty to bring this subject forward. I state candidly that I am not averse to the engines being used on our roads, provided the roads are suitable for them. But what I say is, that they are not fit. Therefore, if you decide on allowing these engines to be used, make up your minds to have new roads. You must not misinterpret my feelings, because I do not object to their use, but only that the roads are not at present in a condition to allow of their being used. I am sent here to do my duty as waywarden, and I shall continue to do so.

Mr. R. LAKE: All I have to say is, don't check the busy bee, but spur on the drone. As Mr. Carter and others are so deeply interested in agriculture, why not have the roads widened?

Mr. PALMER: I farm in the Isle of Sheppy. If we are not to be permitted to use these engines until the roads are widened, as Mr. Carter proposes, I fear I shall not live to reap any of the advantages to be derived from their use.

Mr. WYLES said he was the owner of an agricultural steam engine working in that neighbourhood, and on his first having it he had orders for seven days' work, and now he had so much work that there were only three days that the engine was not engaged. As the owner of three engines he might state that they had travelled since harvest upwards of 1,200 miles, and had thrashed 20,000 quarters of corn without the occurrence of a single accident.

Mr. CURLING said he had been the owner of a traction engine four years, and had never had one accident, although his engine had travelled several thousand miles.

Mr. FRY wished to state that one of his engines was a ploughing engine weighing 12 tons, and therefore too heavy to be dragged by horses. He confessed he had met with an accident, but that was entirely to be attributed to travelling by night. If they wished to put a stop to steam ploughing they would not do so by adopting the resolution, for steam ploughing was now more in demand than ever.

Mr. JOSIAH HALL, as the owner of an engine working in

the Isle of Sheppy, would remark that if the proviso of Mr. Carter to restrict the use of the engines till the roads were ready to receive them, they would have to wait many years before the roads in Sheppy were fit. There was no farmer but would admit the superiority of steam cultivation, and with the dreadful competition they had to bear up against that was their only resource. He begged they would not inflict the same trammels as had been done in the Ashford district, but give every facility to the use of the traction engines.

Mr. MAXTED said, with him the question was—Are traction engines a good or evil? He contended they were a vast good, and therefore they ought to be encouraged. His experience led him to the conclusion that the closer horses were brought to them the less likelihood was there of an accident. So far from the traction engines injuring the roads he contended they actually did them good. He did not believe that in the "garden of England" they would do anything to retard the use of these engines.

At the request of the CHAIRMAN the deputation of engineers then withdrew.

Mr. ELEY said he thought that as the subject had been so thoroughly discussed there was no necessity for them to avoid coming to a resolution. He would, however, only remark that now the English farmer was called upon to compete with the whole world, they ought to see that nothing was done to retard the science of agriculture. Instead, therefore, of looking on with apathy, let them do everything to aid it, and not put the drag on progress. He would therefore propose the following resolution as an amendment:—Whereas a complaint

has been made to the board of waywardens that danger has arisen to persons with horses and carriages on the high roads from steam traction engines travelling thereon, and being fully convinced, as farmers, that it is of the greatest importance to give every encouragement to the adoption of steam as a valuable motive power for agricultural purposes, resolved, that this board considers it would be most unwise to raise any obstacles to the use of traction engines in the Faversham highway district, but that it is expedient that information be given to all owners of such engines that every precaution be taken by the drivers and other persons to prevent accidents to passengers, horses, and carriages, as this board will deem it to be its duty under the authority vested by the 5th and 6th Will. IV., cap. 50, rigorously to enforce the full penalties in cases of wilful negligence or carelessness on the part of the drivers and others having the charge of such engines.

Mr. COBB seconded the amendment.

Mr. CARTER moved that the passage of the traction engines should be restricted to between 10 at night and 7 in the morning.

No one, however, seconded the counter amendment.

Mr. PALMER was inclined to move that they ought to insist on the traction engines being always moved by day, and not by night.

The resolution proposed by Mr. Eley was then put, and on a division only two hands were held up for the prohibition, and more than fifty against it, Lord Harris, who is a large Kentish landholder, voting with the latter.

Loud cheering followed this decision.

SMALL FARMERS.

TO THE EDITOR OF THE IRISH FARMERS' GAZETTE.

SIR,—I see that Col. Knox Gore's estimate of what ten acres of moderate land may be made by good cultivation to produce, has excited a good deal of controversy both here and in England. I do not pretend to be competent to advance any correct general theory on the subject, but I have thought that some few facts relative to my own immediate neighbourhood may tend to illustrate the matter.

I live in a district where small farmers, mixed with large ones, abound and flourish. They have suffered from the four last disastrous years; but not, I think, more proportionally than the large farmers. Some of each have been ruined; the great majority have struggled with their difficulties and tided over them.

In many respects our district is an average one; but the industry of our farmers surpasses, I think, the average. We have no flax cultivation of any importance; the northern custom of tenant-right does not prevail, and leases are not common. On the other hand, the rents are seldom changed; and I do not hear complaints of the conduct of the landlords, and our land seldom requires draining. Under these circumstances, I have thought that the actual facts relative to three small farms of different sizes might afford useful information. The landlords in each case do not reside in the district; the holders are not peculiarly well circumstanced, but are ordinary instances of honest industrious men.

A holds three acres, plantation measure, at a rent of £2 7s. 6d. per acre; total, £7 2s. 6d. The Ordnance valuation is £5 0s. 9d. The family consists of the mother, two sons (aged about twenty), and two daughters. They suffered much after 1845, the father (since dead) being delicate, and the children young, and unable to earn. The sons now work a good deal for hire, besides cultivating their own farm, and the daughters also. The men between them probably earn thus about from £15 to £20 a-year, at 1s. a-day; the girls about £7 to £10. Their crop this year consisted of 1 acre of barley, from which they sold 16 brls., at 14s. 6d. per brl.; 3 roods oats, not yet sold, probably 10 brls., at 9s. per brl.; 3 roods potatoes, I estimate at 30 brls. of good ones; 2 roods turnips, 12 tons. Their stock at this moment consists of one cow, value £12; 1 one year and a-half old heifer, £7; 1 calf, £2 10s.; 2 pigs, £8 (this price was refused for them at the last fair); total, £29 10s.

The principal items in their balance-sheet will be:

EXPENDITURE.			
Rent .. .. .	.. .. .	£7	2 6
Co. cess. and poor-rate .. .. .	.. .. .	0	12 6
Ploughing .. .. .	.. .. .	2	10 0
Seed barley .. .. .	.. .. .	1	5 0
Seed oats .. .. .	.. .. .	0	12 0
Turnipseed .. .. .	.. .. .	0	3 0
Bought 1 rood of turnips .. .. .	.. .. .	3	0 0
Grazing for a cow in summer .. .. .	.. .. .	3	10 0
Grass for hay .. .. .	.. .. .	1	0 0
5 Store pigs bought .. .. .	.. .. .	3	0 0
		£22	15 0
Profit .. .. .	.. .. .	17	17 0
Total .. .. .	.. .. .	£40	12 0
RETURN.			
16 barrels barley sold .. .. .	.. .. .	£11	12 0
10 barrels oats .. .. .	.. .. .	4	10 0
1 Heifer to sell .. .. .	.. .. .	7	0 0
4 Fat pigs .. .. .	.. .. .	16	0 0
Fowl sold .. .. .	.. .. .	1	10 0
Total .. .. .	.. .. .	£40	12 0

The farm supplies them free with potatoes, milk, butter, and eggs.

I may add in explanation that they hire the grass of a border of some waste land along a plantation, and save it for hay; that they bought the two pigs they have now fat for 30s., and as soon as they are sold will buy two others to fatten before May. They hope to realize more for the heifer and pigs; but I have put their lowest value. Of course, I do not intend £20 to be understood as what may be correctly called net profit, but simply as the return to them for their labour, &c.

B holds 10 acres, at a rent of £2 4s. per acre; total, £22. The Ordnance valuation of the land is £16; and the house, to which the tenant built an addition, for which the landlord gave timber and slates, is valued at £1 10s. Total valuation for taxation, £17 10s. The family consists of B, his wife, and two sons (growing lads), and two daughters. The family do all the work, except the harvest. His crop

this year was 4 acres barley, laid down with clover, from which he sold 16 brls. per acre, at 15s. per barrel; 2 acres oats, 14 brls. an acre, worth about 10s. per brl.; 1 acre 2 roods potatoes, say 60 brls.; 3 roods turnips, say 18 tons; 1 acre 2 roods clover (first crop), eaten; 1 rood house and garden.—Total, 10 acres. His stock now consists of 1 cow, value £12; 1 heifer, in calf, £9; 2 horses, a brood mare, and foal, worth £15, and a young one worth £9—£24; 1 brood sow, £8; 6 young pigs, worth 30s. each, £9.—Total, £57. He this year bought £4 worth of hay. He cannot keep young cattle, as his land is difficult to keep fenced; but keeps a work mare, and breeds foals, works them a little at two years old, and sells them at three or four years old. This year his cow missed calf. His balance-sheet will be:

EXPENDITURE.		£	s.	d.
Rent .. .. .	..	£22	0	0
County cess and poor-rate..	..	2	3	9
Hay bought .. .. .	..	4	0	0
Food for pigs bought .. ..	..	2	0	0
Paid labour in harvest .. ..	..	1	0	0
		£31	3	9
Profit .. .. .	..	64	6	3
Total .. .. .	..	£95	10	0
RETURN.		£	s.	d.
Barley, 60brls. sold and 4 kept for seed	£45	0	0	
* Oats, 18 brls. sold, 10 for horses, &c.	9	0	0	
Sold a 4-year-old horse in May, 1863	11	0	0	
Sold a litter of pigs	5	0	0	
Sold 3 slips of pigs	1	10	0	
Will sell 6 pigs, fattening, at £4 each	24	0	0	
Total	£95	10	0	

The farm supplies potatoes, milk, butter, fowl, and eggs free. There are, of course, other small items to go to both sides of the account, but it would be difficult to ascertain them accurately; and as they would have to be estimated, I prefer to leave your readers to do so, and only to give the main items, which I can give with certainty.

C holds 26 acres at £2 per acre; total rent, £52. Ordnance valuation is £48. The family consists of the old man and wife, his married son, wife, and small children. He employs all the year round one bound labourer, who has a cottage and garden from him; one labourer and a boy, who live with him, and extra hands planting, digging potatoes, and harvesting. He intends to buy some more stock next fair, as he has too many turnips. The bound labourer is paid in potatoes, meal, house, &c.; but, for simplicity sake, I have put him down as receiving 1s. a-day, for which sum what he receives is calculated as an equivalent. The others receive the wages I have put down, and their food. His crop this year was 4

acres of barley, from which he has sold 17 brls. per acre, at 15s. per brl.; 9 acres of oats, not yet sold, have 14 brls. per acre—worth 10s. per brl.; 8 acres of potatoes, about 49 brls. per acre; 2 acres of turnips, about 25 tons per acre; 1 acre of house, garden, and waste—26 acres. His stock now consists of 2 milch cows, value £15 and £18 each—£28; 2 heifers, one and a-half year old, now feeding on turnips, £14; 2 calves, £6; 7 fattening pigs, worth £3 10s. each—£25 10s.; 1 brood sow, £4; 2 work horses, £29. Total: £97 10s. His balance-sheet will be—

EXPENDITURE.		£	s.	d.
Rent .. .. .	..	52	0	0
County cess and poor rate ..	..	6	0	0
Hire of labourers at 1s. per day	..	15	0	0
Do. man in house, cash .. ..	..	5	0	0
Do. boy do. .. .. .	..	1	10	0
Service of bull and boar .. ..	..	1	5	0
Seed barley, &c. .. .. .	..	5	0	0
To buy 2 store heifers .. .. .	..	14	0	0
		99	15	0
Profit .. .. .	..	86	15	0
Total .. .. .	..	£186	10	0
RETURN.		£	s.	d.
69 brls. barley, sold at 15s. ..	..	51	0	0
104 brls. oats, to sell .. .. .	..	52	0	0
Kept 13 brls. for horses, 9 for cattle, 6 for seed; 2 two years old heifers sold from straw, on 1st May, 1863	..	22	0	0
2 stall-feds, will sell at £11 each ..	..	22	0	0
7 pigs, will sell at £5 each .. ..	..	35	0	0
Butter sold, 30th November .. ..	..	4	10	0
		£186	10	0

Has free potatoes, milk, butter, fowl, and vegetables.

Such are the facts relative to these three farms. I leave your readers to draw their own conclusions, and make their own calculations as to averages and general results. The yield of the crops is that of this year—not of every year. C., who is a very intelligent man, tells me that he finds that, on an average of the last three years, his corn crops have been four barrels per acre short of their usual yield, which, as he has generally 13 acres of corn, have been an annual loss of 52 barrels of corn; and the quality has also been inferior. So, also, the price of their cattle may vary from year to year. B. will not always sell his four years old horse for £11. He will get sometimes more—sometimes less. One of A.'s pigs will sometimes die.

Let my facts be taken for no more than they are worth—the actual facts of one ordinary year.

Yours, &c.,

MYLES O'REILLY.

Knock Abbey, Dundalk, Dec. 8, 1863.

TURNIP FARMING IN SOUTH BRITAIN.

South Britain, as now understood, lies upon the oolite and chalk formations, of which the puddled shales or earthy accompaniments are exhibited in the lias, clunch, and kimmeridge clays that occupy the valleys of the first-mentioned deposit, being the "fillings up" of the Wernerians, and are confined to the hollows of the rocky deposit. The chalk, being the uppermost stratified sediment in the structure of the globe, presents a broad surface of formation, and no valleys to be filled up; the deposit is very largely covered with the marine tertiary clays of the plastic and London designation, and even on the top of the highest hills. All these clays are most obdurate and viscous in the texture, and form wheat lands of the most clammy and adhesive quality, requiring much power of animals and implements for the cultivation. Where the oolite and chalk rocks are protruded into daylight, soils are formed by the decomposition of the rock, of its direct

* Most of the oats will be ground for oatmeal and used by the family.

nature, and without any foreign mixture; where the tail of the clays above mentioned joins the rocky sediment, a mixed soil is produced, which partakes of the elements in variety, and in many instances the quartz sandstone which underlies and supports the chalk is upheaved, and mixes with the clay and chalk, and forms several modifications of soil. This sandstone is best known as the iron and green sands of Surrey, laid bare by the great denudation that had swept the chalk from the Wealden valley between the North and South Downs.

The light soils of South Britain are thus formed by the decomposition and modified mixture of marine elements either directly from the rock, or a more remote formation of deposit. In the former case, the quality is weak and incoherent, as over the upper oolite rocks; where the clays are in a modified mixture the viscous marine quality very often adheres in a degree to render the soil untractable, harsh, and becoming a cloddy texture. The true loamy composition is wanting, which constitutes the proper turnip lands.

The soils of Scotland are wholly different, being entirely composed of fresh-water alluviums, that are superimposed on the metamorphic rocks, without any intervention of bouldered drift, warp, or diluvial beds. That country does not possess any rock higher in the scale of stratification than the old red sandstone, which occupies the low grounds, being a rocky "filling up" of the hollows formed by the primary deposits. The rock lies mostly in a deep, continuous, and unbroken mass, and may be reckoned to be both the old and new red sandstone, as there is no intervention of coal and lime to mark the separation. The best lands are over this deposit, which, being in low grounds, possesses the greatest quantity of alluvial earth, which was swept into the hollows. The absence of the colts and chalk deposits prohibits any marine viscous quality in the soil, which is wholly composed in a fresh-water aggregation of earths and sands, with a portion of lime from the surface of the old red sandstone sufficient to form a calcareous grit. Where the situation is too high for the presence of lime, the soils are alluvial earths of a greater or less depth, forming lands in a great variety of quality and value.

All these soils are by nature most favourable to the growth of root crops; the texture is free and open for the eradication of weeds, and the particles are connected for the admission and retention of moisture and caloric in the necessary degree. The climate is also most peculiarly favourable for green plants—rains are frequent, and copious dews are not long wanting, which nourish vegetation in a more equable and efficient manner than heavy falls of rain. A system of managing turnip lands has been most successfully adapted in cleaning the land of weeds, and pulverising the texture by repeated ploughings, harrowings, and rollings, opening the land with drills to receive, and splitting the ridglets to cover, the dung. The turnip seed is sown in the fresh-stirred soil. The soil and climate combine in producing a quality of turnip that far exceeds the roots in South Britain, being hard, brittle, and gelatinised, while the latter are soft and fungous. The crops of turnips, potatoes, and summer vetches are most luxuriant—the severe winter climate does not permit any use of the winter tares. The quality of all animal flesh exceeds that of England from the above causes, which show better beef from cattle fed with the native roots than when fattened with the turnips of South Britain. This fact is well known.

The ridging system of raising turnips is successfully adopted in the North of England, but most signally fails in South Britain on the marine formations that have been mentioned. The frequent exposure of the soil by the many ploughings, and more especially the twice drilling of it, dissipates every moisture, and leaves the soil in a condition of parched aridity. The chalky and sandy soils are weak in the cohesion, give off moisture very freely, and radiate caloric very quickly; and without these two agents no vegetable life can be generated or promoted. On the modified soils of a clayey mixture the frequent workings of the soil convert the tith into small clods, which resist any mechanical reduction, admit drought between the interstices, by which all moisture is evaporated. If this land be twice drilled, the covering over the dung is wholly composed of dried clods, among which the turnip seed never vegetates, or so feebly as to fail in future growth. Sowing the seed in rows on the flat grounds by means of machinery with lengthened coulters, which make ruts to receive the artificial manures and seed in mixture, has been used with success. It is an improvement on double ridging, but liable to the objection of depositing the seed among the dry parched dirt that lies on the top of the ground, from which all moisture has been evaporated by the workings of the land and exposure to the atmosphere. The intervals between the rows of turnips being on the level with the roots, do not afford such a convenient room for scuffling as in the hollows of the ridglets; when the weeds are numerous the destruction is less easily performed.

The climate of South Britain is much less humid than of Scotland, the rains are few and distant, and the dews are none. Not a very large degree of heat prevails, but a dry aridity of temperature, that is very parching, and evaporating of moisture. The quantity of moisture is deficient, which being abundantly supplied to dry bodies, produces the damp and sultry exhalations that are known to constitute one chief cause of fertility. The rains of the summer and spring are planetary in their nature, sudden in the fall, and quick in passing away; the earth is not penetrated with moisture as

by slow falling rains and heavy dews, which descend leisurely into every opening and supply every orifice with liquid food. The parching aridity of climate, and the great deficiency of rains and dews, operate in the total abstraction of moisture from the weak soils of chalks and sands, and also from the clayey modifications of land that retain some degree of the marine viscous nature. The damage is so very great as to render necessary an entirely different mode of raising turnips from any method yet practised.

In the most favourable situations of turnip-farming, it is held as a maxim, in the preparation of the land, that all the operations are done with the utmost despatch, and that the ground be laid into a level condition as quickly as possible, for the purpose of preserving the moisture. This very great advantage is enjoyed by extensive farms—that the workings of the land are done at once and simultaneously, in the processes of ploughing, harrowing, rolling, and the second harrowing; the weeds are hand-gathered, and the land lies in a flat quiescent state till the next working is commenced. This precaution of preserving moisture being reckoned so very essential in the most favoured districts of turnip farming, the husbanding of the winter moisture for the use of the future crop becomes infinitely more necessary in South Britain, where the deficiency is so large of the great nutriment and of vegetable life. The double-ridging system of Scotland is wholly useless on any soils, light or heavy. The objection has been stated against sowing on the flat ground, and it now remains to detail a method that seems to be clear of the faults of both the above-mentioned modes.

In the early winter, and soon after harvest, the stubble ground intended for next year's turnips is ploughed with the strength of four horses, as deeply as the staple will allow; not less than 7 or 8 inches, if that depth can be obtained. In the spring, at the usual dry season of working the lands, Finlayson's harrow is employed across the ploughing of winter, and moves the soil in the depth of the ploughing; the weeds are loosened, and dragged to the surface, the roll and the harrows being employed to crush the clods and collect the weeds. The grubber is next used lengthwise, when the harrows and roll are used as before, the processes being repeated at due intervals till the ground is sufficiently prepared for being sown with the crop. Drills are opened with one furrow of the common plough; the dung is spread in the intervals and covered by one furrow, as in opening the drills, and the turnip seed sown on the fresh tith. When artificial manures are used, ridglets are made by one furrow of the common plough, and Hornsby's drop drill splits the ridglets deeply with a long coultter, and deposits from a funnel the manure and seeds mixed in bulbs at the distance of nine inches where the plants stand in crop. This process being quickly done, and as soon as the drills are made, prevents evaporation, and secures fresh tith to the seeds. By sowing the flat ground the seed is deposited among a dry dust on the surface of the ground. In this way it is deposited deeply among newly-moved earth, which is rolled immediately, and the moisture locked in the soil. The soil being entirely wrought by the grubber, is not turned up as by the plough to the exposure of drought; the weeds are dragged to the surface by the round tines of the grubber, in place of being cut by the sharp coultter of the plough. The moisture is retained in the earth, and kept under-ground, and, when exposed to the air by one furrow of drilling, is ready to exert those agencies that result from the exposure of concealed substances to the contact of atmospheric influence. The whole success of turnip farming, under any external circumstances, depends entirely on the presence of moisture.

Water has been artificially applied for the use of young turnips, but most unsuccessfully; lands wholly finished with, being dunged and sown with turnip seeds, have been watered from the pipe and holes of a water-cart, but very injuriously for the intended purpose. When water or moisture is applied in any way or quantity to soils or earthy matters, a clotted concretion is formed, which is detrimental to vegetable life, and which must be again dissolved before any availment is made of the contents. This objection may be urged in the case of liquid-manure drills; the application will be much inferior to the effect of the moisture in the soil by the above-mentioned mode of preparing the land, which has been filtered into the earth by Nature's process, and retained in its matrix.—J. D.

THE BREEDING AND REARING OF SHEEP.

THE WAYLAND AGRICULTURAL ASSOCIATION.

On Wednesday evening, the 23rd of December, a meeting of the Wayland Agricultural Association was held at the Crown Hotel, Watton, for the purpose of discussing the Breeding and Rearing of Sheep. About fifty gentlemen were present.

Mr. T. BARTON, who presided, briefly opened the proceedings. It was unnecessary for him to say a word as to the object of their meeting, as they had all had notice of it, and most of them were aware of the name of the gentleman who was to introduce it to them. The production of wool and mutton at the cheapest rate was a subject of the greatest importance to farmers. He should not dwell upon the subject, as he did not wish to infringe upon a topic which would be brought before them in an official manner. He should simply call upon Mr. Woods to introduce the subject; and in so doing, he might express a hope that Mr. Woods would be followed by many gentlemen whom he saw present, and whom he knew to be quite able and willing to impart the knowledge they possessed. He hoped that Mr. Woods might ultimately arrive at a result which would be satisfactory to himself and profitable to them (Hear, hear).

Mr. WOODS, who was received with considerable applause, said: Gentlemen and brother-farmers, if I could have consulted my own judgment, I would much rather that the introduction of this subject had been placed in the hands of some other gentleman, so that I might have remained quiet, and have made my own observations, or perhaps have taken some part in the discussion which I trust will follow (Hear, hear). But, seeing that some person must introduce it, I at once acceded to the desire that was expressed to me; but in doing so, I beg that you will allow me to state that it is not with any idea that I possess more practical knowledge upon the subject we are about to discuss than many gentlemen in this room. Nor am I here as a teacher. My object here is what I expect to be the object of many others—to be a learner. I shall submit to you views that have been forced upon my own mind, after something like twenty years' practical experience. I shall submit to you those views, either for your endorsement or for your objection to, on those points that may not be exactly in accordance with your own views. By that means I shall hope to gain information myself, because I shall have an opportunity of hearing upon what grounds you differ from me. I shall then be enabled to compare your opinions with my own; and from that I believe I shall be able to gather much useful practical information for my own purpose (Hear, hear). It is usual on occasions of this kind to introduce the subject by a written paper; but I was told by gentlemen who knew the working of these matters much better than I do, that written papers are frequently—I will not say truly—looked upon as so much borrowed matter. It is extremely probable that I could have written a paper, and read it at this meeting, that would have conveyed my ideas more intelligibly than I can express them in an extempore address; but as I am always willing to place myself in the hands of those gentlemen of greater experience than myself, I at once bowed to the opinion that was expressed. I must therefore ask you to be as lenient as possible in judging of my humble efforts this evening. And believe me, that I have only one object, and that is to throw as much light upon this important subject as it is possible for me to do, because I think, when we come to consider the present price of corn, and what I must call its "unremunerative value," we must all be very well convinced that the present price of wool and mutton is an important desideratum for us to turn our attention to (Hear, hear); and therefore, if, by turning our attention to that matter by meetings of this kind, we can throw a little light upon it by discussing it in a friendly spirit, as I have no doubt we shall this evening, I think every one must be thankful. "In the multitude of counsellors there is wisdom," and I have no doubt it will be proved so by the discussion this evening. Now, in starting upon this subject, I

may say that it is so comprehensive, and contains so much matter, that I felt, in making an extempore address, considerable difficulty to know where to begin and where to end. I therefore consulted with Mr. Barton, who, with that intelligence, that readiness to assist, and that kindness with which he always assists his neighbours, at once lent me his aid; and we agreed to discuss the matter under the following heads:

- 1st. The ewes to breed from.
- 2nd. The rams to use, how to use them, and when to put them to the ewes.
- 3rd. Treatment of ewes during pregnancy: abortion, its causes and effect.
- 4th. Treatment of ewes during the lambing season.
- 5th. Management of lambs when on the ewes, and when weaned.
- 6th. Hoggets—their treatment from July to Christmas.
- 7th. When on turnips, and their treatment thereon.
- 8th. Whether most profitable to sell in or out of their wool.

Now, gentlemen, in starting upon this subject, I feel it to be one of considerable importance, but as you all know that I have strong partialities myself for the pure breeds of sheep, I shall only ask you to allow me for a minute or two to say that I believe the pure breeds of sheep to be the foundation from which all good crosses must spring; and I do feel that every person who may be induced from one cause or another to put down his flocks of pure-breeds does a thing which is of national importance, and one that every farmer and every cross-breeder of sheep must deeply regret. I would ask you, "From what came originally the numerous breeds that have now sprung up?" It is, perhaps, a dangerous question to ask, but I think it is a fair and proper one to ask at meetings of this kind. What did Shropshire spring from? What did the Oxford Downs spring from? What did many others (that are called "Downs" spring from? I will leave that question for others to answer. Having asked you one or two questions, I shall sink the pure breeds of sheep altogether, and the remarks which fall from me this evening shall be made upon what I may call "the Norfolk flockmasters' question"—that is, as to the animals from which we shall breed cross-bred lambs. The first question I would suggest to you for your consideration is one of importance. It is this: "Which do you consider the best for ewes for flock for breeding cross-bred lambs? Do you think the black faces, the brown faces, the Hampshires, or half-bred ewes the best?" This is a question which must be of importance, and which must be of deep interest to every gentleman at this table who is a breeder of sheep. I will not insult your judgment by expressing a view of my own, by stating what I consider to be best for the purpose, because you are men of great experience, you have your own views (and perhaps proper views) for having a certain description of ewes upon your farms. I have no doubt that some gentlemen present will tell me why they prefer one sort to another. But there is one thing that has often occurred to me, and upon which I think as we pass on many gentlemen must agree with me. That point is this—that from whatever kind of ewe you may prefer to breed from, there is a very great difficulty in getting the sort you may require. Now, there is a gentleman in this room (and a very excellent breeder he has proved himself) who told me that last autumn he rode miles and miles in endeavouring to find such ewes as he wished to put in his flock. Generally he was unable to do so, and when he did so the price was extravagantly high. This, I think, arises from the fact that the price is always according to the demand. A great many people want the good ewes, and consequently the sellers put the price on tolerably stiff; and I don't blame them for it. But now what I say is this—that there is not sufficient attention paid by those gentlemen who breed your flock ewes; they pay little attention to the shape and make of the animals they breed, or to

the quality of their wool, because many persons, I am sorry to say (though I hope there are not any in this room) make a point of getting a sheep because it is a cheap one. I think that is very poor economy, because I hold that sheep to be the cheapest which will produce you the lamb that shall pay you the most money whether you sell it, or whether you graze it. Now, I hold that the production of a better class of flock sheep depends very much upon the farmers themselves, because if they would make up their minds to buy only those animals which should be considered by good and practical judges to be suitable for breeding good cross-bred lambs, those gentlemen in the south-east would breed better ewes. I remember crossing an adjacent county last autumn, and seeing a very large flock of sheep there, the blackfaced, being topped by blackfaced rams. I was driving with as good a judge of sheep as any man in the kingdom, and the remark he made was, "Now can it be wondered at that there are so few good ewes bred, when we see here 500 or 600 ewes, possessing no peculiar merit, topped by rams even still worse?" I know that this is a difficult question; but I believe that if the farmers of this county were once to set the example, and say they would only have the best formed ewes—ewes which possessed the merit which is necessary for the breeding good lambs—I believe they would get them. If they were to say, "We will have none of your bare-pollled ewes, with little or no wool on the belly and neck, and no wool under their tails; but we will have those that possess wool, and of a quality of flesh which shall produce us good mutton; if not we will not have them at all," those gentlemen of the south-east would produce them, because they would know that they could not sell bad ones. I throw out this as a suggestion, and I hope to hear some remarks upon it. Now comes another question with respect to the lambs we breed. I have often looked upon the management of the breeding of cross-bred lambs as one which deserves as much attention as such care as the breeding of pure bred Downs or Leicesters, and I base my calculations upon the following fact:—If gentlemen have well-bred lambs they have always a demand for them. I know it from practical experience. It is not only so on our own estate, but it is the case with gentlemen in the neighbourhood; they breed lambs that everybody is glad to get hold of; they have no running about to seek for customers; they have plenty of customers on hand, because the dealers, the farmers, and other people who purchase hoggets or lambs for feeding, are sure to turn their attention in the first place to the well bred ones (Hear, hear). Now, I ask you to compare that with gentlemen who go upon the haphazard style of breeding—who put a ram to an ewe because it is a ram, and not because it possesses any peculiar merit—who say that a ram's a ram, and he's sure to get a lamb. Many people do that, and what is the result? The lamb bred from that careless system of breeding is sure to hang heavy upon hand; no dealers run after that gentleman's lambs; they don't care to buy them, for they know they are bred to sell; and they only take them when they cannot get lambs from other people. Supposing, however, that that person does sell them, the buyer will not come to him a second time; there will be no people coming to him and saying they should like to buy from him again. The very act of trying to graze them has proved that they have no feeding properties, but the reverse, as I know for a positive fact. Gentlemen who have fed well-bred lambs from this estate, have desired to come again and again, and they have done so; every year the value of these lambs is increasing (Hear, hear). But it is not so with those lambs bred in a careless sort of way. Then there is another point which has frequently struck me as a very important one, and one which must have struck home to the heart of every man who goes on Norwich Hill; go there in the lamb or the hogget season, and (you know it as well as I do) you see a group of people here, and a group of people there; perhaps you see a third group, but it is a rare circumstance. How is it? There's a good lot of lambs or hoggets, and everybody is rushing to see them, showing that it is the exception, and not the rule, to have a good lot (Hear, hear). Now I want to see groups of people all over Norwich Hill, instead of that rare circumstance; instead of seeing a few pens of hoggets or lambs which possess far more merit than others. I wish to see them all good alike. I don't think I ever shall see that; but I do trust that we shall see a considerable advance made in the breeding of sheep. Well, we have in this neighbourhood some most extraordinary instances of breeding;

we have both good and bad. I will first give you an instance of the good, and then an instance of the bad. We have gentlemen in this neighbourhood who breed with care—who don't buy an ewe because it's a sheep, but who buy the best they can lay their hands on—who select them for certain points (which they know them to possess) for breeding good lambs. Not satisfied with that, they go and hire or buy a ram also possessing peculiar merits, and well adapted for the ewes they are intended to serve; they put those two together, and there's no fear whatever as to what the result will be. There is no chance in breeding. Breeding good animals is no matter of accident. You might as well attempt to breed a pure-bred shorthorn from an Alderney bull as to endeavour to breed good lambs from ordinary parents. Well now the result is this: those gentlemen can sell their lambs at from 28s. to 30s. each, while other people breeding in a different way, sell at something like 18s. or 20s. This is a matter which offers itself to the serious consideration of everybody who cares about breeding. Then we have another extraordinary case in this neighbourhood, and the reverse of what I have named before. A farmer of the old school, living not three miles south of this town, has all sorts of mongrel-bred ewes on his farm, and a sorry lot they are, and the lambs they breed are such as no man who cares for his credit or his pocket would ever try to fatten. Usage has, as it were, so acclimatised his ewes that he has actually got them to breed nearly all the year round (Hear, hear, and laughter). He runs the rams with them all the year round, and says, "Poor things, they know what's the best; Nature taught them" (laughter). I merely give this as an illustration of two systems. I have no desire to claim more credit for this neighbourhood than it deserves. Well now, gentlemen, I hope I have cleared up some of my points with respect to the ewes that I would breed from. We must now turn our attention to the next important subject, and that is, the rams to use. After getting good ewes, the next most important step is to get good rams. I am one of those who fancy that it is not ill-spent money to give an extra £5 for a ram. I think it is far better to give a fair price than a low one. The profit, I do believe, will be greater upon breeding good lambs than bad ones, and you will never breed good lambs from bad rams. Now we know that in the breeding of cross-bred lambs there is great diversity of opinion. Some gentlemen like Cotswold sheep; some like Cotswold crosses, or Cotswold crossed (I am not in the mysteries of these crosses) with something of a Leicester; and some people like a large Leicester, with a dash of Lincoln in it. Now, it is not for me to say which will best answer a farmer's purpose. I can only presume upon your kind nature when venturing to make suggestions. Allow me, then, to say that I think the adaptation of the rams to the ewes, and their selection with judgment, ought to rest in the discretion (and does, I have no doubt,) of the flockmaster who is going to use them (Hear, hear.) But I have an opinion of my own with respect to the sort of ram which I think ought to be used to short-woolled ewes for breeding cross-bred lambs. I have an idea that he ought to possess merits peculiar to himself; that is to say, he ought to have a good masculine countenance; he ought to have his neck neither too long nor too short, and placed upon his body as though it formed part and parcel of him. His breast ought to be well thrown out in front, and wide and expansive between his fore legs. There is one thing which is being lost sight of, in many pure breeds of sheep; that is, the important point of the shoulders; because I hold that all male animals ought to be so constructed as to have the right power of locomotion. Now, what I do say of many of the pure breeds of sheep, and alas! of many others, is that the shoulders are placed upon their bodies as though they were pieces of waxwork—as if the body had been made first, and the shoulders had been a second thought, and had been stuck on after the body had got cold (cheers and laughter). Well, if we could get their shoulders right I should like to have wide and expanded loins. I should like his tail placed well upon his rump, and well surrounded with mutton; his backbone should be straight, but better a little arched rather than the other way. I should like to see what I call "legs of mutton," deep, full, and weighty. Then I do not want to see them too long upon the legs, because if they are too long upon the legs they cannot travel. Another great and important point is to see that the wool is of the right character, and plenty of it, and that you get a skin not blue,

but of that nice cherry hue that every farmer acquainted with breeding knows must propagate good stock, and stock which will graze. Gentlemen, I am not going to start a theory of my own, but I am going to ask you to bear with me for a few minutes while I say how I consider rams ought to be used. We will suppose, for argument's sake, that some of those gentlemen who do breed those very good lambs, and who deserve credit from every gentleman who grazes, give 7 guineas for one ram, 10 guineas for a second, and 15 guineas for a third. Well, it is very proper; I have no doubt they have done wisely in giving 15 guineas. But it comes to this: they turn all the rams into the flock together. Now, let me ask you whether it is not within the range of possibility that the 7-guinea ram should tup the ewes intended for the 15-guinea ram; and the 15-guinea ram the ewe naturally belonging to the 7-guinea ram, while the 10 guinea ram perhaps takes his choice of both. I hold that, after giving those prices for your rams, the way to get a level crop of lambs is to do this: you should select the ewes for the rams. You have got some ewes with glaring faults which you can see, but which the 15-guinea ram would materially correct. I will go to the other extreme. You have got some ewes that show very well in some points in which the 7-guinea ram is a little deficient. Now, I believe if you were to go upon the principle of selecting the ewes for the rams you would be more likely to breed a level lot of lambs, because you would breed them with corrected points which you could not do otherwise. I am quite aware that you will tell me that this is a very difficult matter. It is a difficult matter even in an enclosed country, and in an open country you will find it still more difficult. It will take a great number of hurdles, it will require more attention, and altogether involve considerable trouble. But, gentlemen, let me ask you one thing—What great success has ever yet been achieved without trouble? There is no limit to the power of man, if he will but direct his mind to an object, and be determined to succeed, and then, as sure as we are here together this night, so sure will he succeed, and only be surprised that he looked upon it as difficult at starting (Hear, hear, and cheers). The object of almost all our cross-breeding is to get as many lambs as we can, because, looking at the prices of wool and mutton and corn, it becomes an important consideration. My experience tells me that if we want—and I will give you some practical instances presently)—to produce plenty of lambs, and if we desire the single ones to come strong and healthy, it is very much within our own control, and it is by these means, and you know it as well as I do—that is, flush your ewes two or three weeks before the rams go to them, and continue that for two or three weeks afterwards: I will answer for the result. Now I will give you my own experience last year. We were rather deficient in early turnips. I tugged some upon layers, some upon the park, and gave them a certain quantity of cake, and one lot upon turnips and no cake at all. We had 25 per cent. more twins from those on turnips than from those on the new layer, or with cake besides (cheers). Now, gentlemen, as we don't wish to have failures with our rams, there are one or two little points upon which it has occurred to me to speak to you this evening. Rams, in my opinion, travel a great deal too far on our flock farms. The principle is, in a great measure, to let the rams run with the ewes indiscriminately. They run with them into the fold at night; they go out with them the next day, and they thus travel a considerable distance. I think you are destroying very much of his vigour by making him so much of a traveller (Hear, hear). What I advise you to do is to let the ewes go out to the heath, the fields, or whatever you think well; but keep the ram at home, and give him a little cake and fresh food. I am quite sure you will be well repaid by an alteration of your present system (cheers). Again, I believe it to be a most important matter, when you put the ram with the ewes, to notice how the ewes are running. If you do not use ochre, how can you tell when their time has elapsed? If you go upon the principle of using red ochre at a certain period, blue ochre at another period, and yellow ochre afterwards, you can tell to a dead certainty how your ewes will lamb—that is to say, when you may expect a number of lambs, and when you may not. I hold it to be a matter of considerable importance, and I wish that every flockmaster paid attention to it; and if you adopt my recommendation of selecting the ewes to the ram, you will see if the rams are seasoning your ewes. Here let me ask, if you make it a rule to examine certain parts of your rams when you buy them, or before you turn them with

your ewes? For depend upon it, if a certain peculiar construction of his generative organs, which is, or ought to be, well understood by every flockmaster or shepherd, is not perfect, he will never produce a lamb; and you would thus not only experience much disappointment, but lose several weeks of the best part of the season. Now the last point under this heading is one which those gentlemen who have cross-breeds will understand better than I do; that is—when ought the rams to be put to the ewes? I think this is a matter which is very much affected by localities, or by the situation of the farm upon which the flocks are placed. If a gentleman is in an enclosed country, if he is well provided with spring food, and is well able to carry along his lambs when they come at an early time, then the ram may go in by the end of September; but as a general principle, where lambs fall in an open country, I would certainly advise Michaelmas as the best time, considering that they would then drop about the 7th of March, and follow from that time. My experience tells me that it is not always the forward lambs that make the heaviest sheep. I can state that as practical information. In our own system of breeding we mark the ears of lambs for the first month, and after the month has expired we have no mark at all. Now let me tell you a fact worth relating at a meeting of this kind. At the last Birmingham exhibition there was one sheep which was said to be the largest Southdown shearing ever exhibited at the Birmingham exhibition, of which you can form an opinion yourselves when I tell you that it weighed 17 stones (imperial) live weight. That wether had no ear mark, proving that he was one month at least younger than the first lamb which was dropped. I merely mention this to show you that Michaelmas-day is not a very bad time. Now we are coming to another important subject, and one which I think must claim the attention of every breeder, that is, "the treatment of ewes during pregnancy," and "abortion—its causes and effect." Every gentleman who has a flock of sheep will, I am quite sure, feel a deep interest in anything that can throw light upon this subject. I am going to deal with it as a plain matter-of-fact question. I am not going to roam into any of the regions of fancy, because I made up my mind at starting that I would confine my remarks strictly to practical matters; therefore I shall do so in this case. The first thing, and the most important thing too, I think, is the feeding of our sheep. I believe this to be the crowning point of our success, or the reverse—abundance of lambs or the reverse. The question, gentlemen, is, "How are our ewes to be fed?" There are two points which I will put to you for consideration. Many of you have been longer in the county, and have had a great deal more experience than I have had, but yet I will ask you one simple question: Taking it as a general rule, have you ever seen these two things together in Norfolk, viz., a good crop of turnips and a good crop of lambs in the same year?" I think you will find in nine cases out of ten that the reverse has been the case. The simple fact is, I believe, we are too free in the use of our turnips (Hear, hear). There is another question, upon which, however, I do not profess to give an opinion myself, because my experience has not carried me to that, but it is a question upon which many gentlemen may be able to give us some practical opinion. It is this: Is it right to allow the ewes to follow the hoggets when on turnips?"—that is to say—"Is it right to allow the ewes to feed upon the refuse food of the hoggets? My opinion is that it is not; that it is not only a barbarous custom, but also a dangerous one (Hear, hear). I do believe that by placing the ewes to follow the hoggets, they not only get a great amount of indigestible food, but they take up a great amount of silt, which must act as an irritant to the bowels. My experience tells me that abortion is probably produced by two causes, and comes at two periods of the pregnancy of the ewes. The first time generally happens between the 25th of December and the 6th of January; then, I fancy, it is produced by food that is too stimulating to the generative organs, and which thus acts on the uterus, and causes it to expel its contents. The next stage, and I believe the most dangerous one, happens about the month of February, which I believe to be produced by the great amount of indigestible food which the ewes have taken up between those periods. You have all witnessed a great amount of fever in the system, which produces an inflammatory action over the whole system of the animal, and abortion is the result. You have it shown to you by the effect the fever produces afterwards, because at that time of the year seldom do you get a

case of abortion without the ewe losing its wool, and, I would ask, in how many cases its life also? Now, how are we to alter this? I hold that it is, I will not say entirely within our own control, but if experience is worth anything, and I will give you that experience, it tells us that it is almost within our own control. Let me give you one or two startling facts, and facts that I defy any man to get over. Up to 1853 the Merton flock of sheep was known to be as unhealthy as regards abortion as any flock of sheep in the county. In that year we had something like 110 cases of abortion, and we lost 80 ewes. I felt that the time was come when a change was necessary, and that to go on in that way was stamping those who had to do with them with a want of intelligence, care, and discretion, that ought to be thrown into the management of so valuable a flock. I therefore entirely altered the system which was then in use, and I determined that never again after a certain time of the year should they have another turnip until nearly the time of lambing, and the system I followed out was this: we put our ewes on turnips for tuppence, and kept them on for six weeks; we got an abundance of lambs by that means. I brought them back again on the park. By taking them off in the autumn months the grass grew a good deal. There was a great amount of food which would last them very well in an open season until the end of December or the beginning of January. Then I gave bran and chaff until about a fortnight before the time for the first lambs to fall. I then placed them upon turnips, taking care to give very few at a time, and with good allowance of chaff. Now it is a fact that from that day we have not had a single case of abortion on the farm, and our average number of ewes lost has never, up to the present year, exceeded five. But there is another point to which I must come—a point in which all light-land farmers will take great interest. That question is—“Does clayed land materially affect the health of the ewe?” I know the prevalent opinion is that it does, and probably it may; but I say that that is very much within the control of the flockmaster himself. I believe it, with the care and intelligence which a person may bring to bear upon it, that may be very much controlled, and I will also give you some practical experience upon that matter. I have been told time after time that the Waterloo Farm would kill any sheep, no matter whether they were hoggets or ewes, or any other sort of sheep—they could not live upon it, and still more unhealthy would it be if it was clayed, and as to ewes, the man would be mad who would attempt to keep them. Now that farm has been clayed very heavily; it has been clayed, marled, and chalked. All those three materials which are held to be injurious have been brought to bear upon it, and what has been the result? Not that all the sheep died, but I can give you a fact worth your consideration. From Michaelmas, 1861, to Michaelmas, 1862 (the last year we held the farm, and consequently at a time when we had to feed entirely off turnips grown from artificial manure on clayed land), there were on the farm 306 ewes, 340 hoggets, 100 shearlings, and we bred 362 lambs. Now comes the tug of war. Between 1861 and 1862 our loss comprised the following: 5 hoggets, 10 ewes, 3 shearlings, and 3 lambs—total 21 lost out of 1,098 sheep, including lambs, and not a single case of abortion (cheers). But I am happy to say that this good luck did not end with the occupation of Lord Walsingham. Through the kindness and fairness of our excellent tenant, Mr. Bunting, I am enabled to give you the result of his experience for the year. He had 300 ewes upon his farm last year, and he had not a single case of abortion; his loss of ewes was only five. Now I think that is a certain proof that, under judicious treatment, with proper feeding, the virulence of clayed land may be very much mitigated. Now it is right to say upon what principle we went. I don't give it to you as a new light; I only give the practical experience of myself and others. I don't attempt to push it down your throats as an original idea, for I have no doubt it has been borrowed from some other person. We only give a limited amount of turnips, but a large amount of dry food, and some bran, and to that system I attribute the little loss we had. I do hold that upon newly clayed land the evil effects upon breeding animals is produced very much by luxuriance of the growth of the turnips, and by their containing so much matter that is indigestible by the ewe, and when there is no correcting influence, inflammation is produced, and hence abortion. I have now got through the treatment of ewes during pregnancy, and I only trust that I have made myself

intelligible upon that point, and given you some material facts worthy of your consideration (cheers). I would here call your attention to a matter that requires your serious consideration, and that is with respect to shepherd's dogs. Is it right that they should be allowed to run about where breeding ewes are, frequently disturbing and often alarming them? I believe the evil is often more serious than we are aware of, or would be willing to acknowledge. Some shepherds know how to use dogs, but with them it requires care; but how is it with a careless lazy fellow, having a wild and badly-trained dog? And then, again, with feeding or fat sheep, dogs are still less required. Quietude is what all fattening animals require, and this I am sure they do not get where dogs are prowling about. Now the next thing is the treatment of the ewes during the lambing season. This, I think, you will all admit is a very important matter for our consideration, because it is one in which every man who has a flock feels a very deep interest. I believe that to keep them healthy up to the day of lambing you must not limit the supply of dry food. Go on with it; don't be afraid of spending an extra £5 for a ton of bran, for I trust the millers will one day get it down to that price. One thing has struck me in the large flocks of Norfolk, and that is the little care that appears to be shown, or rather felt to be desirable, for the protection of the lambs. In large flocks the shepherd is frequently overworked; the lambs are often dropped in very severe weather; there is very little protection for them; there may perhaps be 15, or 20, or 30 pens, but there are not pens enough, and I have seen a great many lambs perish from this cause. Now it is of great importance to every flockmaster, whether great or small, to prepare a yard for his sheep to be in. It is not necessary to have them in yards on a mild and fine night, but you should have a good and well-sheltered yard, abundantly supplied with pens, and then you can put your flock in the yard if the night becomes an unfortunate one; because I feel quite sure, and I have proved it by my own experience, that any little outlay upon this matter is well repaid by the number of lives of lambs saved. Then there is another matter which I put to you who are flockmasters, and which I ask you to be good enough to consider, viz., whether there are not—I will not say through carelessness, because it is an unkind word to apply to a most useful class of men—but, through almost the anxiety of our shepherds, many ewes and lambs perish? Generally, unless the man is experienced and well up to his work, he causes the deaths of many lambs and ewes by injudicious haste (Hear, hear, and cheers). There can be no question whatever that nature is the grandest nurse and the surest doctor; therefore my opinion is that you should let nature do its own work. When the ewes are lambing, do not be in too much haste. Watch them; but give them time, and they will right themselves; and never have recourse to the use of the hand until you see that the ewe has given up using her own efforts, and she appears exhausted (Hear, hear, and cheers). Then there is another matter which is no doubt well known, but which, to make my subject tolerably perfect, it is right to go into, viz., inflammation, which frequently follows lambing. You have seen it scores of times no doubt. After about three days some of the ewes will begin to strain and droop, showing that a violent inflammation of the uterus is going on. Now our practice has been—and you are able to judge for yourselves how far our practice is worthy of being followed by the figures I have given you—we have immediately bathed the ewe frequently with warm water, and afterwards we often have used injections made from poppy heads, as well as a copious supply of Day's Extract of Driffield Oil, which I believe to be one of the most valuable farmers' friends yet brought out. After that we give three ounces of salts, two teaspoonfuls of sweet spirits of nitre and two teaspoonfuls of laudanum. In many cases that has been successful in saving the life of an ewe. Then there is another thing which deserves to be treated upon as one affecting not only the health, but the life of the ewe, and frequently of the lamb also, and that is the garget, with which you are too well acquainted. We all know that this is produced by cold. Now our practice has been a very successful one, because we have got a most intelligent shepherd—a man whom I hold to be second to none in the kingdom in the management of a flock. If it is the black garget, he lances the udder very freely, applies common salt very copiously, and rubs it well all over the udder. After doing that, he turns the ewe, and bleeds her from the large vein running up the centre of the belly, and very

freely. He closes the orifice by a pin and a little tow (the same as you would in the case of a horse), and gives at once half an ounce of jalap and half an ounce of alum in half a pint of beer. In most cases he is successful, not only in restoring the ewe, but in rare cases of retaining the value and perfection of the udder also (sheers). You know other garglets are often shown you by the hardness of the udder. Now in that case we do not scarify the surface of the udder; it is not necessary. We give it medicine, and we bleed; but think it would be highly improper, and without any good effect, to scarify the udder. In speaking on this subject, there is one thing which it will not be out of place for me to name, viz., the importance and the value of a good shepherd. A good shepherd on a farm is one of the most important servants—a man who, if he is really a good man, deserves greater consideration than any other man employed upon the farm, for this reason: how much property has that man under his care! how much we lose if he is a careless shepherd! how much we save if he is a careful and judicious one! I will not blame the system, but I have often thought that in the annual migration of shepherds there must be something wrong, because it keeps men in a state of not knowing what they are going to do—whether they are going away, or whether they are to stay. If you get a good shepherd, value him, and teach him that his place is worth keeping; pay him well, and keep him upon the farm; do not let him, as soon as he knows what to do and what not to do, be moving about, and endeavouring to find a better place; but make him feel that to be a good servant he must do his duty, and that you will reward him for doing it (Hear, hear). Again, in the lambing season, I think that more is expected of a shepherd than a man can do. Nature has a limit to which it will allow a man to go, and beyond that is treason. Frequently a person has only one shepherd, with, perhaps, a page, to attend to a large flock of breeding ewes. The shepherd desires to do his duty, but he becomes worn out by sitting up night after night. He cannot attend to the ewes as he ought to do. Many a lamb has perished, not from the fault of the shepherd, because he could not help it, but because he had more to do than ought to have been expected of him (Hear, hear). Now, the next head to discuss is the management of lambs, when on the ewes, and when weaned. I know very well the delicacy with which I ought to introduce this subject, because I am speaking in the presence of gentlemen of large experience—men who are well able to judge for themselves, and who require but a very few remarks from me upon a matter of this kind; but there is no harm in giving my own experience. I believe that the first and the most important thing to do is to feed the ewes well, so that they can do their duty to the lambs; for nothing can be worse, nothing can propagate more disease and more weakness in lambs, than not to keep the ewes well at a time when they ought to feed their lambs. We have frequently found, after about the third day, the lambs of some mothers more than others are troubled with a certain kind of diarrhoea. A kind of whitish excrement comes from them, which has a very disagreeable smell. This is clearly produced by undigested milk, which, if not soon removed from the bowels, will produce an amount of irritation that will end in death. We give at once two teaspoonfuls of castor-oil, a teaspoonful of ginger and one of magnesia, the object being to carry off the irritation, but at the same time to cool and quiet the stomach. If that does not act in the way we desire in staying the diarrhoea, we give ten grains of powdered chalk, half a drachm of tincture of rhubarb, and ten drops of laudanum, which rarely fails to produce the desired result. I am sure you don't want me to tell you that the way to grow good lambs is to take good care of your ewes. In the first place, get good layers, and then fold the ewes; give them mangold and cake, and let the lambs run out. Of course the more cake you give the ewes, the more grateful both the ewes and the lambs will be for it. Then another simple little thing is the tailing of the lambs. It is a simple operation, but if performed at an improper season often produces very unfavourable results. If it happens to be an unfortunate night, with the wind in the north or the east, the lambs are liable to suffer. Our experience has told us that the best time for cutting and tailing is when the lamb is about two or three weeks old. We, of course, select a nice warm day, with a south wind if we are fortunate enough to get it, and we watch them very carefully at night. If we find

any getting stiff, or lying about more than they ought to do, we take every means to make their blood circulate freely, and consequently that generally sets them right. Now I come to the sixth heading, which is the treatment of hoggets from July to Michaelmas. This is a question with which gentlemen of large experience are well acquainted, and it will perhaps be unnecessary for me to say that a frequent change of pasture is desirable. We have always found that to give barn with cake has done more towards the growing our hoggets successfully up to the time when we wish them to be put on to the turnips than anything else; in fact, it keeps them healthy. In other things we have bought experience once or twice. By too suddenly flushing our hoggets with too much highly stimulating food, we have produced a great amount of fever; but when we have done so, we have been fortunate enough to hit upon a remedy, which has very much corrected it. If we find we have been unfortunate enough to get into that dilemma, we give to each the decoction of half an ounce of senna leaves and an ounce of salts, frequently followed by a second dose in the course of a fortnight. We have rarely failed to carry off the fever, and our hoggets go on satisfactorily afterwards. I believe it also to be very important to dip our lambs in July or August. I merely make this remark to say that I have tried most of the compositions of note which have come under my notice, and I have no hesitation whatever in saying that I have found none so good for ticks or lice, or any other insect that can affect a sheep, as the composition by Allen, of Lyan. Of course we always take very great care in giving our hoggets turnips on pastures for some three weeks, or they have even gone on as long as a month before putting them wholly on turnips; and I have found that they do not then suffer. I will now give you the experience of myself and other gentlemen as to hoggets fed upon clayed land. This year we have 220 ewe hoggets feeding upon clayed land, clayed at the rate of something like 100 loads per acre; they are in the same field that they have been in ever since Michaelmas. I state it as a practical fact, that never since those ewe lambs have been fed on those turnips one of them has ailed anything; they have very much improved in condition and appearance. It is not for me to say anything in favour of them. I shall ask Mr. Palmer, who had an opportunity of seeing them the other day, to say what he thought about them; and, still better, I would ask you, when you are going through the parish of Tottington, on the Tottford road, to cast your eye to the right, and turn in at the second gate after leaving Tottington village; look at them, and judge for yourselves. They have, in addition to ground white turnips, half a pound of cake per sheep per day, and we give them a little long hay in racks. I must tell you that the land used to be light-blowing sand, but I hope its blowing is stopped now. There is another thing in the feeding of hoggets, which I have found during the last two or three years to be of the greatest possible importance, and that is always to give a little chaff with the cake, because we have found that it has done as much as anything possibly can do, towards staying everything like diarrhoea, or running out. I know it was the practice of the late Mr. Jonas Webb to do so. He used to say, "How would you, sir, like to be fed on a piece of roast beef day after day, and no vegetables or bread with it?" He held that the chaff was the bread or vegetables to the cake, and consequently the animal not only ate it with a relish, but that it acted upon the bowels in staying somewhat the laxative effect of the turnips. In feeding turnips with hoggets or with any sheep, and where the sheep eat their own turnips, it is well known how important it is to give plenty of hurdle row for the sheep to fall back. It appears as though the sheep have an instinctive knowledge that it is good for them to eat up the old dry and withered turnips in the afternoon, to correct the effect the fresh turnips fed in the morning might have on their bowels. Now there is one matter of interest in this part of my subject, viz., cotton cake. I am not able to give you any information on this subject with respect to hoggets; but, from what little experience I have had myself, in giving cotton cake to sheep, to Down ewes, I have determined never to give another pound of it so long as I have to do with sheep. Its effect upon the sheep was that of a powerful irritant upon the surface of the skin; seventeen ewes lost the greater part of the wool of their fore-quarters, and immediately I withdrew the supply of the so-called cotton cake, the irritation ceased. I have had a letter from my brother, who has the management of the Duke of Portland's model farm at Clip-

stone Park, and who says that his experience tells him that the same value of linseed cake is far more useful and valuable than cotton cake. The butchers have told him that the mutton produced upon cotton cake is more yellow—in fact it is quite yellow compared with that produced from linseed cake. I trust that gentlemen who have had experience in feeding with cotton cake, will be good enough to state to us the fact of what they have done. I would merely mention, when speaking of feeding sheep, that we have found that when some of our animals were being forced rather sharply, they began to show symptoms of crying out "Hold hard," having had enough; we then bled them very severely indeed. I will give you a fact connected with this bleeding, which occurred to me. Within the last fortnight we had a lot of sheep in such a condition that we were almost frightened. We found one dead; the consequence was that we immediately bled the others so sharply, while many of them could scarcely stand. The fact has been that we have not lost a single sheep since, nor has one of them ailed anything. I believe the cause of death in that one sheep was apoplexy. By copious bleeding we removed the cause and saved the lives of our valuable sheep. The next and the last point is a very important matter, viz., as to whether it is most profitable to sell hoggets in or out of their wool. I think this is a very simple question, and one which comes within the knowledge of every farmer. I think the answer depends upon localities and circumstances (Hear, hear). If a man has got a lot of sheep that are fairly ripe, which will come out of their wool and handle well, show plenty of mutton, and that of the right quality, then I say, "By every possible means clip them." But if it is doubtful how your hoggets will come out of their fleeces—if there is something about them that a man don't know whether they are quite up to condition—then I think prudence says, "Don't clip them" (Hear, hear, and laughter). We don't want to enter into the mystery of these matters further than this, because feed also will regulate this matter. If a man sees that his hoggets are not quite up to the mark, if he has got plenty of mangold, and can carry them on his layers for a few weeks or months, and make them ripe, he will be guided by circumstances. I believe that every farmer is the best judge as to whether he should sell his sheep in or out of their wool. Gentlemen, I have now gone through the heads of my subject, and I will only make one or two concluding observations. The object of a meeting of this kind is to provoke discussion (Hear, hear). I trust I have thrown out material enough to answer that purpose (Hear, hear), and I also trust that any gentleman here present will not, out of a feeling of kindness and consideration for me, have the slightest hesitation in attacking any of my weak points, but that he will at once do me the favour to point out the weak parts of my address, and give me an opportunity of gathering from this meeting the information which I seek at your hands (Hear, hear). I would also beg of you to understand that it is not necessary in an agricultural discussion to make a grand and flowing speech; that is not what is required; what we want is, that gentlemen should be good enough to give us the benefit of their opinions, that they should state these opinions in language with which they are familiar, and then I am quite sure they will convey to us their ideas in the light in which we wish to have them. If they will be good enough to do this the object of this meeting will have been accomplished, and I shall have had my reward.—(Mr. Woods, who had spoken for nearly an hour and a-half, resumed his seat amidst loud and prolonged applause).

The CHAIRMAN having invited discussion,

Mr. MAYHEW said he was sure they must all have been highly gratified with the very able address from Mr. Woods, not only on account of the clever way in which he had put the subject before them, but also for the plain and practical knowledge of which he had given them the benefit (Hear, hear, and cheers). He began with the selection of the ewes, into which he did not go so fully as they who were breeders were obliged to do in making their purchases. He (Mr. Mayhew) believed that no class of sheep for breeding half-bred lambs was equal to the brown faces or Hampshire. There was much prejudice against that breed; they were said to be bad mothers, but his experience had proved the reverse; he had found them breed quite as well as the black faces, and the mutton they pro-

duced was decidedly more marketable. He was greatly opposed to buying what was commonly called "a cheap sheep," and was equally opposed to giving extreme prices; as in the latter case they were simply paying the breeder for his great care and skill, and for having, by artificial means, fed them up to a great pitch, which was very often prejudicial to the farmer when the sheep were brought on to poor soils (Hear, hear, and cheers). He thoroughly agreed with what Mr. Woods said about rams. Purchasers of lambs generally, he thought, did not pay that attention to breeding which they (the sellers) had a right to expect. The quality of the lamb did not alone make it marketable, but the size, the "upstanding," as it was termed. He thought there was not that inducement for producing good things which there ought to be. He agreed with Mr. Woods in saying that turnips were the best food for ewes at the tupping. Last year he (Mr. Mayhew) was very successful with his lambs, his ewes having been fed upon turnips, either entirely or with a small portion of cake. After that season, however, they scarcely tasted a root. He gave his sheep cotton cake, which Mr. Woods had condemned, though he (Mr. Mayhew) was not prepared to say that pollard was not better. Upon that cake, however, his ewes had been healthy throughout. He began about the middle of February, and they continued to eat it until the latter part of June. This year he had drawn all the roots off the dark unhealthy land, and made up the feed by a certain amount of cake. To a certain extent also he had improved the land, for it was certain that upon light soils, which were naturally unproductive, unless they supplied a large amount of artificial fodder or manure, they could not expect to reap those crops which would enable them to pay their way. Upon many light lands he thought too much attention was paid to the fold and too little to manure in the yards. Upon all light lands the turnips must be folded off, or they would get no corn at all. He (Mr. Mayhew) preferred the more expensive way of drawing the roots off, and feeding the bullocks in the yard, giving them a certain amount of cake to keep up their condition. The land from which the turnips were drawn was folded with sheep fed on artificial food. With respect to Waterloo Farm he wished for an explanation; was it the soil the sheep took up while feeding the roots off the land that was injurious? or was it the quality of the turnips produced by a clayed soil that was supposed to be so? This was an important matter, for on some farms the losses were enormous, and in some seasons took away the profit altogether. He thought they ought to pay more attention to the forcing their lambs up to marketable condition. Something, he thought, should be given in the trough, and the twin lambs should be drawn off as soon as they were old enough and fed separately with cake; they would afterwards find the lambs more uniform and more saleable than if they were all allowed to run together, as was often the case, the lambs becoming (from the mother's want of proper food) stunted and unprofitable (cheers). As to hoggets, he thought they should be kept from the same ground where the ewes had previously been running (Hear, hear). Where sheep had been folded, the growth was very luxuriant, and to lambs it was very prejudicial (Hear, hear, and cheers). That was merely an individual opinion, but he should be glad to hear something from gentlemen of greater experience than himself.

Mr. SUTTON thought it entirely depended upon the locality as to what descriptions of sheep were kept. On poor light land farms the Hampshire would not answer so well as the black faces, which travelled better. His sheep had to walk a long way.

Mr. T. GAYFORD agreed with many remarks which had fallen from Mr. Woods, though with some he did not agree. With Mr. Sutton, he thought that the locality materially altered the case. He did not think they had been really speaking of the Hampshire Down ewes, but of something of a cross, which was termed the brown faces, which was thicker, of more substance, and decidedly a slower traveller; that, however, made her a bad nurse. Unless the lamb was well nursed for the first six weeks, nothing that they could do afterwards would retrieve the loss of proper care and attention at that time. The blackfaced ewe was a remarkably good nurse. He did not care how great was the quantity of artificial food; unless the ewe got a fair proportion of the produce of the soil they could not keep the lambs healthy. Mr. Woods,

and gentlemen who were well placed, did not encounter the difficulties which met those who had large, poor light land tracts, viz., that of getting a sufficient quantity of the natural produce of the soil to give with the artificial food (cheers). He used the brownfaced ewe, but then he had not far to travel. He contended that the food did not do the lambs anything like the good when they had to travel to it. There was a practice of forcing the young lambs on to the grass early, with the idea of their new layers getting up strong; by that means, however, the lamb was irrevocably punished. He knew that flockmasters were accused of not taking sufficient care in the selection of their rams, but it was difficult to get them as good as they should like at a reasonable price. When the lambs on the average cost them 2s. 6d., 3s., or 4s. in getting, that became a serious item in the cost of an animal which upon the average was only worth 25s. Scarcely anything else cost in the same proportion. He had had scarcely anything to do with hoggets, his object having been to produce lambs for early sale. So much now was thought of size, that if beginning he should prefer to have his own crosses; he would take the best Down tup and the best Leicester ewe, and that cross, he thought, would produce the most mutton and pay the best price (Hear, hear). He, however, contended that they were running too much to size, and losing some of the benefits of quality.

In reply to Mr. MAYHEW,

Mr. T. GAYFORD said he believed that an animal of the cross he had mentioned would not be quite so large as others; but he contended that the quality would counteract the size, and that he should make the most wool and mutton from the same quantity of food.

Mr. THOS. MATTHEWS, jun., liked size, but was also of opinion that the description of sheep depended on the description of the farm. Black-faced ewes might suit Mr. Sutton, and on all large farms; but on small occupations he liked the brown-faced ewe, with quality, and as big as he could get them. He should like a Lincoln ram, the best he could get of the improved breed, and with a short-woolled ewe he thought he could get what they wished to have. For the last ten or twelve years his practice had been to give each ewe, after lambing, from a quarter to half-a-pound of good linseed-cake; if there were twin lambs, the ewe got pretty nearly a pound, though that mainly depended upon how he was situated for food. He then set out a field as a layer for the lambs, and as they began to eat the cake so he reduced it from the ewes. Lambs always tried to eat their natural food—grass, and they learned to eat it before sheep knew what cake was—(laughter)—and if they had sufficient grass they would run past the trough; if, however, the ewes had the same chance as the lambs, they would run into the fold; and if lambs got half-a-pound of cake per day they grew. If they were left to themselves, some would go to the grass and others to the cake, and they would very soon present an uneven appearance.

Mr. ROPER said he had come there quite as a learner, and as a young flockmaster he had paid great attention to the subject. Mr. Woods had scarcely provoked any discussion, his remarks having been so much to the purpose. The only point upon which there was any difference, arose from the description of the land they farmed; but it was an undisputed fact that Hampshire would not do for light-land farmers. At the tupping season he preferred colewort or mustard as being rather more forcing. They must be very much indebted to Mr. Woods for the remarks he had made about doctoring. It had been too much the custom if a sheep was ailing to kill it. At least nine shepherds out of ten have a very great prejudice against doing much to their sheep. They have a few old-fashioned ways, but many of them are found to be very useless, and very few sheep that are taken ill ever recover. With every other description of animal, if their stock was ailing the veterinary was called in, and if possible they were cured; but seldom was anything done to sheep; they had to take their chance. The remarks from Mr. Woods had been very *apropos*. They could not carry all these little receipts in their minds; but he hoped they might have an opportunity of seeing them in print, and by that means conveying them to their shepherds. That would be a new feature in the management of their flocks, and he hoped that many of them might be induced to try those remedies which Mr. Woods had brought before them (cheers).

The CHAIRMAN thought it was quite evident that no person had come there with a lighted candle put under a

bushel; every one had spoken his mind, and without any favour towards the gentleman who had introduced the subject, and most of them had agreed with him in the line he had taken. He (the chairman) might be laughed at for encouraging the description of sheep that had not been noticed, and he was perhaps the only person who kept them; they were cross-bred sheep, tupped with Oxford Downs. This was the first year he had bred them, and therefore he should not speak positively as to the result. All he could say was that they had produced as much wool again as the others; they cost 10s. or 12s. less, and they bred more lambs. On some future occasion he might have an opportunity of imparting to them the result; if it was satisfactory he should go on, if not he should fall back upon the Downs, though the Downs were rather difficult to obtain. It was now time to draw this discussion to a close, and in doing so he was sure they would all be of one mind, that a vote of thanks was due to Mr. Woods (cheers). An able and practical address had been delivered by him, and the meeting had been very satisfactory. He would therefore propose that the cordial thanks of the meeting be given to Mr. Woods for having brought this matter before them, and express a hope that whenever any subject might again be submitted to them, they might meet with as able an exponent of it as Mr. Woods (loud cheers.)

Mr. WOODS, who was received with renewed applause, thanked the meeting for so kindly endorsing what the chairman had said, and for the very patient and kind hearing that they had given him. He was extremely glad that the remarks which he had offered had met with their approval. He should go from that room strengthened in his views, feeling sure that they had been expounded before a body of men who were well able to judge whether those remarks were true in practice or not, and who, if they differed from him, would have told him where he was wrong. It would be affecting a modesty which he could not confess to feel, if he did not say that he felt extremely proud of their approval. He might, perhaps, in conclusion, be permitted to make one or two very short observations upon what had fallen from gentlemen who had spoken. He thanked them very much for having stated their opinions, from which he was sure they would all reap a benefit. Mr. Mayhew was correct in thinking it was not right to pay too much for fat. It needed a man with a keen discriminating eye to be able to detect the points, the quality, and the peculiar merits of a breeding ewe. That man would become a successful purchaser, because he knew what to look for, and where to find it. Fat very frequently covered a multitude of faults (Hear, hear). With what Mr. Mayhew had said about size and quality, every practical man must agree, and with respect to cotton cake it was extremely probable that he (Mr. Woods) did not get cotton cake at all; therefore, he should not dispute the practice, or say that Mr. Mayhew was wrong, because it was quite sufficient that Mr. Mayhew was satisfied with the practice. He only hoped that others might be more fortunate than himself in their first essay on cotton cake. With respect to the point on which Mr. Mayhew desired an explanation, he said that ewes on following hoggets must necessarily take up an amount of soil which would produce a certain amount of irritation of the bowels, though not sufficient to cause abortion if they had a considerable amount of dry food given to them. He had merely put it as a suggestion, and asked for information. When they fed their ewes on the Waterloo Farm, the turnips were not cut; and Mr. Bunting did the same last year. Mr. Bunting has this year adopted the wise precaution of pulling all his turnips for some days before his hoggets and ewes came upon them; consequently, the top became withered, the sap dissipated, and the evil effects considerably remedied. He doubted whether that practice would do in very severe weather; but up to this time it was eminently successful. Mr. Mayhew's remarks as to the evil effects produced by the lambs running too thickly, thoroughly bore out his (Mr. Woods') opinion and the opinion which must have been formed by everybody who had to do with the breeding of lambs. Mr. Sutton's remarks were to the purpose, and encouraged them into discussion; but he (Mr. Woods) had never attempted to deny but that locality ought to rule a farmer's practice. He believed the blackfaced ewe was a good working sheep; but he wanted to know whether they could not be very much improved by shortening the neck and the legs, widening the loins, and straightening the back? Mr. Gayford, who had also spoken on this subject, conveyed the same impression that localities

must rule flockmasters. He (Mr. Woods) did not deny that, but he did deny that turnips were the natural food of sheep (Hear, hear). He should be very sorry to say that they could keep their flocks without turnips: they could not do it—it was impossible: but what he did contend was that, if they must give turnips, they should give something to correct the effect of them. If they could give them nothing else, they should give them some clean, sweet straw, cut into short chaff. Mr. Gayford doubted very much if pasture was good for lambs; and, taking it in the proper acceptation of the term he believed that pasture was the very worst thing they could put lambs on. If he misapprehended the word, he was sorry for having done so: he meant layers, when he before spoke of pastures. He had the management of some land, for which he gave £8 an acre; and last year he sent some lambs down to that pasture, which he considered would push them along. They did not make so much progress, by thirty per cent., as those lambs which were on land at £1 per acre, where they were eating layer, and only the same amount of cake (cheers). Mr. Gayford went in for what he called "size;" and he (Mr. Woods) confessed that he was a perfect glutton for size. A gentleman, however, had written an article in one of the agricultural papers about the Smithfield Club Cattle Show; and after saying that everything was praiseworthy, that Lord Walsingham's sheep were perfection, the only fault he heard mentioned by good judges was that they were too big (laughter). It was a mistake to apply the word "size" to sheep. Size meant weight. That sheep possessed the most size which weighed the most for the butcher (Hear, hear, and cheers). They wanted sheep possessing those qualities which would bring them the most money for the least outlay. With respect to Mr. Gayford's

Leicester ewes and Southdown rams, he (Mr. Gayford) had sent him a note across the table, to say that he did not wish for the exclusion of all other breeds for crossing. His argument was that he believed, from a Leicester ewe and a Down tup, more mutton could be got than from any other cross, although he should hesitate before he adopted them. He did not mean to say that a Leicester ewe would be the best to keep upon a farm, but that it would produce the most mutton. On poor-soil farms Leicester ewes would not live, as they had not sufficient locomotive power: they would be perfectly put out by some of the browfaced or Southdown sheep. There could be no question that Mr. Mayhew spoke with authority; and he (Mr. Woods) could only add to that gentleman's remark, that of course, if they gave cake to the ewe, it improved the quality of the milk, and consequently had a good effect upon the lamb. He hoped that Mr. Roper would have the goodness, for the sake of that society, to try the effect of dry food upon his ewes, and tell them at their next meeting how he was satisfied with it. He had made some very pertinent remarks as to the want of knowledge in the treatment of sickly ewes. If his (Mr. Woods's) prescriptions were in any way instrumental in saving the life of a single sheep, he should be delighted. Of Mr. Barton's cross-breeds he could only say that they did him either infinite credit as a breeder or great credit as a feeder. In conclusion, he could only say that, whoever might have the honour of next addressing them, he hoped they might find as kind, considerate, and agreeable company as he had done (cheers).

The discussion then terminated: and the CHAIRMAN announced that the next meeting would be held in the middle of March, 1864.

COLONEL FITZWYGRAM'S DIRECTIONS FOR SHOEING HORSES.

To shoe horses with ordinary feet we would suggest the following directions to the farrier:—

1st. With your drawing-knife take off from the ground surface of the crust as much as may represent a month's growth. Remember that there is generally a far more rapid growth of horn at the toe than at either the heels or the quarters. More, therefore, will require to be taken off the toe than off other parts; in other words, shorten the toe. Be careful to make the heels level. Having lowered the crust to the necessary extent with the knife, smooth it down level with the rasp.

2nd. Round off the lower edge of the crust with the rasp. Do this carefully and thoroughly. If a sharp edge be left, the crust will be apt to split and chip. The preparation of the foot is now complete. It remains to fit the shoe to the foot.

3rd. Let the shoe be made with a narrow web ($\frac{3}{4}$ -inch), of even width all round, except at the heels (see direction No. 8), flat towards the sole, and concave to the ground.

4th. Turn up the toe of the shoe on the horn of the anvil. The degree of "turn-up" must be regulated by what you find necessary in each horse to make the wear nearly even all over the shoe. It will be found in practice that most horses take much about the same degree of "turn up."

5th. Make five counter-sunk nail holes in each shoe—viz., three on the outside, and two on the inside. Make the anterior hole on each side immediately posterior to the "turn up." Let the second and third holes on the outside divide evenly the remaining space on the heel. Let the second hole on the inside be opposite to the second hole on the outside.

6th. Let the nail holes be punched coarse, i. e., nearly in the centre of the web, brought out straight through to the other side. This may be done with safety where a good crust has been preserved.

7th. Fit the shoe accurately to the foot. It must be as

large as the full unrasped crust, but no part must project beyond. The shoe must be continued completely round towards the heels, as far as the crust extends.

8th. The web must be narrowed at the heels, so that its inside edge may cover the line of the bars, and no more.

9th. Slope off the heels of the shoe in the same direction as the heels of the crust, so as to prevent the possibility of their catching in the hind shoe.

10th. Select nails that will fit exactly into, and completely fill the nail holes.

11th. Twist off the clenches as short and stubby as possible, and lay them down flat with the hammer, and let the pincers during this time be firmly pressed against the heads of the nails. The clenches are not to be filed either before or after turning down, nor is a ledge to be made in the crust to receive the clenches. For ordinary hind feet the pattern of shoe in common use is recommended, but with a clip on each side, immediately anterior to the first nail, instead of one only at the toe. This double clip keeps the shoe steadier in its place than the single. The web should be made somewhat wider at the toe than at other parts, in order to allow space for the thorough sloping of its inner edge, as recommended under the head of Over-Reach.

For reasons which have been already explained, the hind foot does not require to be shortened at the toe like the fore foot; but the other directions given above—namely, as regards lowering the crust, rounding its lower edge, accurate fitting without rasping, punching the nail holes coarse, nailing, and clenching with the total absence of rasping, paring, opening the heels, cutting away the frog or bars, &c.—apply equally to hind as to fore feet. Six nails—viz., three on each side—are needed for the hind shoe. Without the third nail on the inside, shoes are apt to "twist" on the feet. The horse is now shod. Nothing more must be done for the sake of what is sometimes called appearance. The best iron only should be used for shoes. Good iron makes a light shoe wear as long as a heavier one of inferior metal.

THE AUSTRALIAN COLONIES, THEIR CONDITION, RESOURCES, AND PROSPECTS.

The subject of the Australian Colonies, their condition, resources, and prospects, was brought before the Society of Arts, at a recent ordinary meeting, by Sir Charles Nicholson. This is a topic which has often occupied attention in our columns, although not in the collective view taken, because it is utterly impossible to do anything like justice to either of the seven or eight colonies by this collective grouping. To Australia the eyes of a large number of Englishmen are naturally turned, as well on account of our great dependency on it for wool, as for the extent of the trade we carry on with that quarter, and the fact that so many of our population have relatives settled there. The present population of one and a quarter million souls settled there, is now being added to at the rate of 20,000 to 80,000 annually from England. The aggregate external trade of Australia (imports and exports) now exceeds fifty millions sterling. The value of the produce imported from thence, exclusive of gold, reaches seven or eight millions; whilst last year we sent there British goods and manufactures to the amount of twelve millions.

Of the magnificent agricultural capabilities of Australia, in its wheat, maize, and other cereals, we have spoken on previous occasions; but there are other important products yet to be developed: and the Society of Arts, with that interest in behalf of the colonies which it has always manifested, is endeavouring to stimulate production by the offer of premiums. Among others offered in their premium-list just issued, are—for the successful introduction into the Australian Colonies of coffee cultivation; for the production and manufacture of not less than one ton of cane sugar; for the extension of tobacco culture; for the introduction of the Ailanthus silkworm, and the production of not less than one bale of silk; for the production of flax of a good marketable quality, a sample bale to be sent; and for the introduction of spice-trees, or any other useful commercial plant. The colonists themselves are urging on the production of cotton in Queensland, the Colonial Government giving a bounty of 8d. on every pound produced; and, with a sea-coast of 1,800 miles, and a favourable climate, all that is really required is labour, to enable them to meet the wants of the British manufacturers.

Mr. Baker, Inspector of Factories, in one of his latest official reports, calls attention to the deficiency of raw material. The growth of flax, he observes, appears to be decreasing everywhere whence we have hitherto been supplied; and though an annual knowledge of the acreage sown is as essential to the vitality of the linen trade, as where cotton is to come from is to the cotton trade, the growth of flax is exciting no very extraordinary attention. The changes taking place in agriculture, and the diminution of cottier farms, which are peculiarly favourable to flax cultivation, owing to the cheapness of home labour, and the facility with which flax can be prepared in the first instance, make the matter more important. In England we have no statistics of flax; in Scotland they have been given up; in Ireland they have been collected for years by Mr. Donnelly, in a most satisfactory manner—a proof of what might be done elsewhere.

The imports of foreign flax show already a very large deficiency this year as compared with the corresponding period of last. In the ten months of the present year the decrease has been 231,800 cwts. If there should be a flax famine as there has been a cotton famine, we

should again suffer extremely, with the consciousness that by a little timely forethought those sufferings might have been alleviated, if not averted. A company was started in Yorkshire early in the year, including some flax mill-owners, for the purpose of collecting flax in this country from the farmers, and preparing it for the trade; but the company has been broken up, for want of encouragement even from the trade itself.

So also with regard to the statistics of the production of English wool we are sadly deficient. We guess that there is a sheep to an acre on all the farm lands in England; but whether it is so or not, we are totally in the dark. But for Australia, and, even with Australia, but for rags reduced to wool again and re-manufactured, and foreign yarn, many of our woollen mills would long ago have been at a standstill. With the increase of emigration to Australia, consequent on the land bounties offered by several of the colonies, the production of wool is increasing. New pasturage is found, and the continent has been traversed from north to south and from east to west, although much of the interior is yet unknown. In the last five years the quantity of wool we have received direct from Australia has risen from 50 million pounds to nearly 71½ million pounds, and the imports this year are already much larger than those of last year.

In the face of this immense production of so important a staple, it was curious to see present at the meeting of the Society of Arts Sir Edward Macarthur, the first shipper of the small quantity of 2 cwt. of wool in 1807. And the present shipments of 32,000 tons of wool may be regarded as the product of a few score pure merino sheep that were, in anticipation of their suitability to the Australian climate, introduced into New South Wales by an enterprising and far-seeing colonist, the late John Macarthur, Esq. The sheep of the Australian colonies have now increased to about 25 millions, and as the labour of one man will on the average suffice for taking care of 1,000 sheep, occupying an area of eight or ten square miles, and pasturage is abundant, there is no appreciable limit to the extension of flocks. Squatting, that is to say sheep and cattle farming on unsold lands, rented in large blocks from the Government, has, especially within the last ten years, been the most remunerative pursuit carried on in Australia. The enormous increase of their flocks and herds, the vast territory they occupy, and the national importance of what they produce, are well known. Gentlemen from England, without experience, professional men turning to the Bush rather than to their professions, men of capital or education, or neither, or both—representatives of all these classes have grown wealthy by squatting; and that not in isolated cases, but almost as a general rule. Nay, you find plenty of rich squatters who it is palpable could not have got on in any calling demanding much mental power, either natural or acquired, men who have been fortunate enough to take to the one pursuit in which they could not help making money in spite of themselves.

These remarks must, however, be qualified by the admission that such success has only attended those who have luckily obtained good runs, and have held them during the last ten years, which have been years of prosperity to the squatters. In this pursuit, as in most others, the race has not been invariably to the swift, nor the battle to the strong; and in adverse times, and under adverse circumstances some energetic and able men have

failed in pastoral pursuits. Prior to the last ten years, the occupation was by no means so prosperous as it has since become. Many squatters were then in difficulties, and most of them were in debt to their town agents; but since then the tables have been turned.

In New South Wales about 50,000,000 acres are held under lease, chiefly for pastoral purposes. Some of the runs in the interior comprise 250,000 to 500,000 acres; and the quantity of cattle and sheep possessed by the squatters of this colony would give an average of more than seven head of horned cattle and seventeen sheep for every man, woman, and child in the colony. The new colony of Queensland, evidently a pastoral country, is that where sheep farming is now the most successful, and wool the staple product, the export being upwards of 6,000,000 pounds annually from 3,500,000 sheep.

Victoria, which had but 1,600 sheep and 120 head of cattle in 1835, now owns 6,000,000 sheep and 750,000 horned stock; while its neighbour Tasmania possesses 2,000,000 sheep. Passing on to New Zealand, we find that pastoral occupations occupy a large share of attention in the provinces of Canterbury, Nelson, Auckland, and Otago. The whole province of Otago, embracing about 8,400,000 acres, is in the possession of flock-owners, on licences for 14 years. In a few years, on an average seven or eight, the whole country will be resumed, and facilities will then be offered for the profitable investment of capital, on terms ensuring a secure tenure to the sheep farmers, and a better income to the Government. In the mean time these properties change hands at a valuation of from 1s. to 2s. an acre for the goodwill of the property. Though the land referred to is in the possession of the sheep-farmer for a certain period, any portion of it may be resumed at any time should it be required for agricultural settlement. The number of sheep in the province is roughly estimated, including lambs, at 1,000,000, and the importations are large; the clip of wool is satisfactory, and the percentage increase of lambs particularly so.

Our last advices from the Australian colonies supply us with much useful information, and especially with the statistics and reports officially compiled of their agricultural and pastoral condition. Next to high prices we know of nothing so calculated to promote the progress of these colonies as the periodical publication of their agricultural and pastoral returns. Mr. Rolleston for New South Wales, Mr. Archer for Victoria, and Mr. Calder for Tasmania, have issued their returns. In these each sees what the others are doing, how far they are getting forward, or to what extent they are going backward, from time to time, and thus the competitive spirit is kindled and stimulated.

Mr. Calder, the Surveyor-General of the Colony, has issued a series of important tables on the agricultural trade of Tasmania. Among others we find a return of the imports and exports of agricultural, orchard, milk, dairy, and forest produce for the last three years, from which we find that the average imports were £123,315, and the annual exports £831,237. The average weight of fleece yielded by each colony for a series of years is also given. For South Australia it was 8 lb. 15 ounce, two-tenths; for Victoria, 8 lb. 6 oz., five-tenths; for Tasmania, 3 lb. 2 oz.; for New Zealand, 2 lb. 9 oz., nine-tenths; for New South Wales, 2 lb. 5 oz., one-tenth; and for Queensland, 1 lb. 10 oz., seven-tenths. Mr. Calder seems to think that in the colonies of New South Wales, Victoria, and Tasmania, the increase of sheep is kept down in part by disease and by the pastures being so fully stocked that they will carry no more in their present condition.

The projected settlement of the new country around the Gulf of Carpentaria will open up a great market for sheep. If the settlers require to have their flocks re-

newed in the upper parts of New South Wales and Queensland, how much more will that be the case in Northern Australia!

A brisk trade in rams promises to spring up between Tasmania and the neighbouring colonies. In the northern parts of New South Wales and in Queensland, flockmasters complain greatly of the deterioration of the wool of their sheep from the great heat, and of its influence on the carcase. To arrest this, there is no remedy but the importation of fresh blood from colder climates, and their attention has been much directed for this purpose to Tasmania. Mr. M'Kinlay, manager for Messrs. Tooth and Co., of New South Wales, lately came to Tasmania and bought one ram, for which he gave £100, and a number of others, for which he gave in the gross £600. Mr. Kermode, also, lately sold one hundred rams, at £5 6s. each, to a New South Wales breeder, and when these were being driven through Victoria to New South Wales, a Victorian breeder declared his intention to come down, and get another hundred at the same price, if possible. These supplies, moreover, must be had periodically, say, every third or fourth year, and a fair opportunity will thus be afforded for an increasing trade of this description. From Mr. Kermode's prime flock of sheep, the wool fetched the highest price at the late July and August London wool sales, namely, 8s. 7d. per lb.

Nothing is better known among flockmasters and others than that the removal of sheep to warm climates has a tendency to the deterioration of their wool. From this they are suffering at this moment greatly in the upper parts of New South Wales, and also in Queensland. Nor is there any way of checking it but by the importation of fresh blood. And that must either be from England, from the continent of Europe, or from the milder climates in the southern hemisphere. To do so from England or from the continent of Europe is attended with great expense and risk. The New South Wales and Queensland flockmasters have consequently had their attention a good deal directed to Tasmania for that purpose, of late. The great heat in the northern colonies causes the fleeces of the Saxon and Merino sheep to become lighter and lighter from year to year. It also has a great influence on the carcase. Not only is there a tendency in the wool to become more and more attenuated, but there is also a great falling off in the carcase, however carefully the sheep may be looked after, or however well they may be fed.

With respect to the land under cultivation in New South Wales, Mr. Rolleston supplies us with the following:

"In 1862, it amounted to 297,575 acres, and 1863 to 302,188 acres—increase, 4,563 acres. Their wheat under crop in 1862 was 129,375 acres, and in 1863, 117,854 acres—decrease, 11,521 acres. Their barley and oats under crop in 1862 were 41,779 acres, and in 1863, 50,001 acres—increase, 8,201 acres. Their potatoes under crop in 1862 were 10,039 acres, and in 1863, 9,282 acres—decrease, 757 acres. Their maize under crop in 1862 was 59,149 acres, and in 1863, 78,282 acres—increase, 19,083 acres. Their gardens under crop in 1862 were 8,707 acres, and in 1863, 8,410 acres—increase, 297 acres. As their total acreage under cultivation is 302,188 acres to a total population of 367,495 souls, the total acreage of Tasmania under cultivation is 253,050 acres to a total population of 90,728, they have less than an acre under cultivation for each individual of the population, and Tasmania nearly three acres for each." This is very nearly what they had in cultivation in South Australia last year in proportion to their population. Their population for that year was 135,329, against 367,495 in New South Wales, and 90,728 in Tasmania.

Wheat is a grain largely cultivated in Tasmania, both for home consumption and for export, either as grain or

four. The average produce per acre, by the rough style of farming practised, has been for some years from 19 to 21 bushels; on good farms the produce is double. By Colonial law, the market bushel of wheat is fixed at sixty pounds, but it is frequently grown to weigh sixty-five to seventy.

"The Tasmanian International Exhibition Commissioners have presented to the Southern Tasmanian Agricultural Association some specimen samples of the agricultural produce of France, Spain, Belgium, Sweden, Liberia, East and West Canada, &c., which, as matters of curiosity, will probably form the interesting nucleus of an agricultural museum, few of the specimens being equal to those of the United Kingdom, or even of these colonies. Some pure samples of English wheat and barley are deemed worthy of introduction here, where our sorts have got much mixed. These sorts are, *wheat*: Hunter White, Spalding, Victoria Red, Browick Red, Chidham White, Kestingland Red, Talavera White, Prince Albert's White. *Barley*: The Chevalier, Golden Melon, Stiff-strawed, and a fine specimen from Wiltshire, unnamed. Samples of these have been pretty widely distributed. It is only by numerous experiments, in various localities, with different sorts of grain, that it can be ascertained which are the most profitable descriptions for cultivation in Tasmania; and when it is known that in England one sort of seed has been found to yield an increase of from two to three bushels per acre over other sorts, with the same treatment, on the same land, the importance of such experiments becomes manifest."

Speaking of South Australia and New South Wales, Mr. Rolleston says: "They had 494,511 acres of land under tillage last year; that is equal to 3.65 acres to each individual in the community. We had but 302,139 acres, equal to 0.82 acres to each person; that is, they had more than four times the extent of land under cultivation to each head of the population than we had." And Tasmania was not very far behind this. Again: "They had 320,160 acres under wheat last year, that is, 2.40 acres to each person; we had, both for hay and grain, only 117,854 acres, or 0.82 acres to each person; that is, they made more than sevenfold provision for the staff of life than we did." Here Tasmania appears to some disadvantages as compared with South Australia, but greatly to advantage as compared with New South Wales. The acreage of wheat for that year in Tasmania was 60,826 acres. Consequently, South Australia had more than two acres to

each person; Tasmania more than two-thirds of an acre to each person; and New South Wales less than one-third. Once more: "Their wheat harvest produced 3,841,824 bushels, at the rate of twelve bushels per acre: ours produced 1,054,954 bushels, at the rate of nine bushels per acre." Here the advantage was exclusively on the side of Tasmania, which produced 1,800,569 bushels, or at the rate of sixteen and a-half bushels per acre.

But when we abandon wheat, and come to fruits, particularly to the vine, the palm must be assigned to South Australia. This Mr. Rolleston cheerfully does on behalf of New South Wales. And it may not be uninteresting to observe how gracefully he does so:—"Although the returns of last year show an increase in the breadth of land planted, it is by no means what it ought to be. Our fellow-colonists in South Australia are far outstripping us in this most important and profitable branch of industry. They had 4,777 acres of vineyard last year, against 1,459 acres in New South Wales. They produced 472,297 gallons of wine, against 144,888 gallons in New South Wales. Their increase in the last year was 859; our increase for the same year was only 329 acres. They exported over 20,000 gallons of wine last year; we exported 10,062 gallons." This should be a provocative to others similarly circumstanced with South Australia. If one sort of grape vine cannot be grown to advantage, there are ten that can. And yet this important branch of industry has been so neglected by many of the colonies as not to be thought worthy of notice in their annual statistical tables.

We proceed now to the live stock statistics for New South Wales. Their sheep in 1862 amounted to 6,155,651; their horned cattle to 2,620,883; their horses to 273,389. In Tasmania the sheep at the same period amounted to 1,661,225; the horned cattle to 83,143; the horses to 20,742. But there is this amazing difference between them: On all these returns, as compared with those for the previous year, there is an increase for New South Wales, and a decrease for Tasmania. On the sheep in the former colony there was an increase of 530,597, but a decrease in horned cattle of 348,460, and of horses 40,169. In Tasmania there has been a general decrease of 77,248 sheep, 3,811 horned cattle, and 1,426 horses. This decrease is not to be accounted for by any special disease or larger export of stock than former years, and would therefore seem to arise from sheer neglect on the part of the flockmasters and stockholders.

"FARMERS' POLITICS."

"The new Card," as just arranged by the Committee of the Farmers' Club, is sufficiently significant of the growing feeling amongst agriculturists to assert and maintain their own rights and privileges. The programme for the year bristles, in fact, with FARMERS' POLITICS. Country folks pretty commonly are no longer content to discuss merely the relative merits of certain systems on certain soils, or the value of different breeds of stock as adapted to different localities. The English yeoman is now rather desirous of ascertaining whether he starts on really fair terms, before he lays out his capital in more manures, new steam cultivators, or improved Shorthorn cattle. Hence we have the injustice and anomaly of the Malt Tax again as an opening, and as leading up to something more, we trust, than the Chancellor of the Exchequer's Committee, which would simply confine the burden to a question of feeding

stuff. Professor Voelcker's topic for March, on FEEDING STUFFS generally, may be considered the more practical or less political than anything else on the list; but Mr. Dumbrell with the NEW ASSESSMENT ACT, Mr. Chandler on the CORN RETURNS, Mr. Spearing as to COUNTY EXPENDITURE, and even Mr. Mechi on some of the CAUSES THAT TEND TO RENDER FARMING UNPROFITABLE, all promise to strike out beyond the mere A. B. C. of the art into the wider field of finance and equitable administration. It is scarcely necessary to say that the majority of these themes have been already before the Club, while some, such as the Malt Tax and the way of taking and making the Corn Returns, have been repeatedly considered by the quondam Bridge-street Parliament. Indeed, the only absolutely novel subject is the working of the New Assessment Act; a measure which, on a very brief trial, has created a deal of ill-feeling and

dissatisfaction. It is not our purpose here to in any way attempt to anticipate the treatment of the question, but we may appropriately enough proceed to inquire, at this early stage, whether the farmers have really any right, or whether it is decent and proper on their parts, to interfere with or object to the carrying out of this system of assessment, even though they may be themselves directly concerned in the matter?

We have of course an object in asking so much, as the Club, on the face of it, would seem to be rather out of order, it having been very recently decided down in the West that a tenant should not object to his assessment, and that he should leave his occupation on daring to do so. A gentleman, moreover, who has come before the country as a FARMERS' FRIEND, has been directly instrumental in enforcing this penalty on the obstinate man who refused to stay his complaint against what he conceived to be a gross injustice, at the beck of an agent. It may perhaps, however, be as well to state the case, as we gather it from a long correspondence in the Dorsetshire papers; while the offender, so far as is possible, shall tell his own tale. Mr. John Trask, then, says, in answer and explanation of some previous reference to the matter: "I and my father and grandfather have been connected with the Phelps family at Montacute, for a century and a-half, but I have only held this farm thirty-nine years; my father having taken it for myself and my brother, in 1825. The tenant whom we then succeeded, having been distrained upon by his landlord, went out all but penniless. We, myself and brother, entered upon it at an advance of rent of just one-third more than was then given by our predecessor: that rent continued during the lifetime of the then Mr. Phelps, he now and then throwing back 5 per cent. At his death, it came into the hands of trustees for the present Mr. Phelps, then a minor, who had the whole estate surveyed, and a small reduction was thereupon made to us. This has continued up to the time of the unfortunate lunacy commission, when Mr. Moody and Mr. Richard Phelps were appointed the committees by the Court. Then another valuation was required, and my farm was raised about 10 per cent.; this, though not expected by me, I did not complain of. I have always paid my rent without the shadow of complaint. I have also erected a part of the buildings on the farm. I have grubbed up old crooked fences, and planted new ones at my own cost, and have done very many things that tenants on lease are not always found to do. The unpardonable sin which I have committed appears to be that I have appealed to the Assessment Committee against the sums to which my farm was charged in the New Valuation List; this Captain Phelps told me I had no business to have done. There is also one other thing by which I may have given some offence. The rating of Montacute House has been raised by the Assessment Committee, and as I have been a member of that body, I possibly have offended; indeed, I am told it is the greater offence. It perhaps may be surprising to many of your readers to know that Montacute House, of the magnificence of which much is said, together with the gardens and 120 acres 2 roods 3 perches of woods and plantation, have not till within a somewhat recent period ever been assessed to the parochial rates at all, not even when the cost of the poor was double what it is now, and three-fourths of the tenantry of the parish were sold up by the landlord. I should state that in 1841 I left the management of the Abbey Farm to my brother, and accepted a tenancy under the Lady G. Fane, still continuing my share in the business as before, and keeping the cash and ledger account; this continued till the death of my brother, in 1850, when I again returned to Montacute, not till I had been requested

by the late Rev. R. Phelps to do so, whose letter, not a copy, I here beg to hand in, the entire contents of which are welcome to the public. I have also some letters from Mr. Moody which will show that even he appeared to have entertained some respect for me when they were written; these, also, the public shall have a sight of, when I have obtained his permission to do so."

Thus much as to the actual facts, while it may be as well to learn something as to Mr. Trask's real character from his neighbours; and "A Farmer," writing to *The Sherborne Journal*, at once supplies such evidence as that we require:—"The course taken by the Committees of the Montacute Estate, in reference to Mr. John Trask, has been generally canvassed, not only by the tenantry, but also by many of the landowners of the county; and, as far as I have heard, but one opinion prevails—that it is a most uncalled-for, harsh, and unjustifiable exercise of power on the part of the committees, and calculated to affect, to a very considerable extent, the interests of the tenantry of the county. It should be remembered that a very large proportion of the county of Somerset is held under yearly tenancies: thereby expressive of that good feeling that exists, or should exist, between the owner of the land and the occupier. Now, if Mr. Trask is turned out of his holding simply for having appealed against the charge made upon his farm under the New Assessment Act, what yearly tenant can feel himself secure, or what man will be so unwise as to invest his capital as it should be done, on so precarious a tenure? I, and very many others, have known Mr. Trask, as a farmer, for the last thirty years, and have always considered him, not only a good farmer, and one most careful of the property which he held, but also a man of high, honest, and honourable principle. I have also been informed by several individuals, who have within the last few weeks gone over his farm, that there is abundant evidence of the high state of culture in which it now is."

This of course opens up all kinds of collateral questions, and as Mr. Trask is said to be not the only sufferer, the whole district is clamorous for Tenant Right, or compensation clauses to the yearly tenancies of the country, so that a man may not be ruined by exercise of any proper independence of action. It is satisfactory to ascertain that Mr. Trask is in such a position as not to feel his eviction as many men might; but he was nevertheless turned out of his long occupation at the shortest possible notice, the intention to serve this being withheld from him to the last moment. A good farmer will readily understand what a tenant of capital, who was doing the best by his holding, must sacrifice under such circumstances, and Mr. Trask himself computes his loss at a thousand pounds.

It may be as well here to keep as close as we can to the point. Have tenant-farmers any right or reason to appeal against the amount at which they have been assessed? Mr. Trask, acting in some ignorance, or without precedent, considered that he had; whereas one of THE FARMERS' FRIENDS in Somersetsire has by his act declared that it is altogether unbecoming to do so; and the man, as a consequence, loses his farm. No explanation whatever, we believe, has so far been deigned by the more powerful party, although the matter cannot rest where it now is. Had Mr. Trask been a needy man, he would have been doomed to certain ruin, by simply protesting against an injustice that a poor man of all others should be the first to protest against. The case, in a word, is not that of Mr. Trask, but of the whole country; and noticeably enough, "A Farmer," we have already quoted, when writing some weeks back to his own local journal, finishes his letter by asking whether "this will not furnish matter for discussion at our coming agricultural gatherings?" The Farmers' Club of England has

already answered in the affirmative; but whatever encouragement this may offer, we would strongly impress it upon the good men of the district not to let the subject

die out "about home." Elsewhere it becomes a grievance that can only claim some share in the general consideration of the question of Assessment.

THE PRIZE SYSTEM.

I regret that this subject has again been prominently brought before the agricultural public, and by objectors who enjoy much of its confidence. This prize system has certainly attained a good old age, having reached its "three score years and ten"; but that to my mind is no sufficient reason for discarding it. On the contrary, it has of late years received such universal adoption, and has rendered such eminent service to agriculture, that it appears to me almost indispensable to the full development of its powers in all its departments. Our leading men in any given mechanical department may advocate its extinction. They have had their day, and are now enjoying the fruit of their inventive ingenuity, judgment, and industry; but what are our rising men to do? They are not, nor will not, be satisfied with things as they are. Perfection is not reached in any one phase of agriculture yet. Breeders will aim still higher; mechanics will continue to invent or improve upon older inventions; scientific men will write essays. Why are they not to be stimulated by competition? It is not so much the value of the prize, as the distinction, the honour, of having won it. This distinction being obtained by a breeder or a mechanist, will bring its reward with it, supposing, of course, that all is fairly won; and it is this distinction that exhibitors look for when put upon their trial. It ensures sales, and brings a lucrative business with the prize.

The prize system has its imperfections, its failings, particularly in implements and machinery. These chiefly arise from inefficient trials in competition, or from no trials at all, but merely dependent upon the judgment or caprice of the judge. This is obviously wrong. An experienced judge may arrive at a tolerably accurate estimate of the degrees of usefulness and value of implements and machinery; but it is only an estimate, without proof. I witnessed a beautifully got-up mill being put upon its trial at Carlisle. A few rounds of the strap from the steam-engine sufficed to jump it off the platform, and nearly to smash it up at once. The gearing, wheels, and pinions were out of proportion; but ignorant men would be purchasers if such trials did not prove their worthless character. Again, I saw a prize awarded on speculation at a local meeting, which, upon a subsequent trial at one of our great meetings, in competition with others of its class, proved to be quite correct. With stock the thing is altogether different; still every man has his taste, not to say prejudice, and prizes will go accordingly. These minor matters will interfere, no doubt, with the full efficiency of the prize system; but be that as it may, there cannot remain a doubt but that we are indebted to this system for the high standard and position we, as British agriculturists, have attained.

If I felt disposed to cavil at all, it would be with the insufficiency of the trials of implements and machinery, and the selection of judges. At country and local shows these trials cannot, without too large an expenditure, be effectually conducted; but as regards the selection of judges, particularly for stock, so far as I have seen, they excel our larger societies. The stock shown is of a local character, and men well acquainted with the varieties likely to be shown are sought out; hence the decisions at local shows are less criticised than at our great exhibitions. The Royal Agricultural Society have ample funds; they

have the means whereby to institute the most effective and accurate trials. At their annual meetings all is done that can be reasonably expected in order to arrive at a just conclusion, a correct decision; but it is almost impossible, in the very nature of things, from the vast competition. Threshing machines are perhaps ten minutes under trial, chaffcutters five minutes, pulpers three minutes, and all others under a like inefficient test. From steam cultivators down to washing-dollies, none have sufficient time; and in many cases, with cultivating implements, it often happens that the land is so hard and intractable (witness the Worcester meeting) that it is impossible to make fair work, and is frequently in such a state that no farmer would think of meddling with it if in his own occupation. I am fully convinced that the prize system, if properly entered into and managed, is and will be of inestimable value. It must be conducted upon truly business-like principles. Take steam cultivators, for instance, or other implements for cultivation. Land must be engaged; exhibitors must make their entries, and hold themselves in readiness to compete when required to do so; judges must be appointed, who shall inspect the land, and be responsible for the efficacy of the trial, *i. e.*, they shall decide upon the time and direct the trials, which of course will be when they deem the land to be in a suitable condition. We may thus expect an accurate decision. It is not the implement that is powerful enough to tear up every obstruction that can best prepare the land for farm service. Ploughs, harrows, cultivators, rollers, indeed every field implement ought to be tested under suitable and favourable circumstances.

The Royal Agricultural Society is rich enough, and is the proper Society, to undertake such prolonged and efficient trials. It may occasionally, however, happen that these trials can come off at the Society's annual meetings. All the better; because the visiting public can then witness them. What I maintain is, that they never ought to take place under adverse circumstances: it is detrimental to the implement, and a gross injury to the exhibitors. Many visitors at the Worcester meeting were so disappointed with the work made by the steam cultivators as to discard the idea of steam cultivation altogether. This is a fact.

I am by no means partial to a large staff of officials, but I am satisfied on this point, that, so far as regards stewards, a laborious and prolonged work of this kind cannot be properly effected under their arrangement and guidance. It is more than can be expected of them. A gentleman may give up a few days to attend and render aid at the annual meeting, but it is too much to ask his presence at such an extended system of trials as I would institute for every class of competing implements and machinery. Mr. Gibbs surely has enough to do. There would be required a field manager of efficiency, talent, and responsibility, to see to all these matters; and a very useful officer he might make himself, not only in this, but in very many other ways. He might not only superintend the field trials, but, under the Society's Director, do most of the hard and responsible work of the show-yard. The meetings have now attained such gigantic proportions as to require good men of tried judgment and experience. I am of opinion that a general field and yard manager is

required, to whom the director and stewards might look to see their orders carried out. If these trials are satisfactorily made, we shall hear but little of the abolition of prizes or the prize system. They should be so correctly taken as to form a guide to every one desirous of purchasing, be it a set of steam tackle or other implement, his own judgment being his guide as to suitability for his own use or the soil he cultivates. It is said the trials may take place as heretofore, but it is the contention for prizes that is wrong: it leads to the manufacture of frail machinery, just got up for such tests, and of but little further use. The published reports of such trials being

sufficient and to be depended upon, I am old-fashioned enough to prefer seeing a large red-lettered placard upon machine or implement: it calls public attention at once, and may be viewed and examined in two or three days by some 40,000 or 50,000 visitors, not 1,000 of whom would read any published report. Depend upon it, if the prize system is done away, a large class of inventors and improvers will be brought to a stand, and our progress in every department of agriculture will be deplorably impeded if it does not retrograde, which would most probably be the result.

P. F.

THE MALT-TAX.

It may be somewhat out of my province, as a practical farmer, writing generally upon practical agriculture, to take up a subject of taxation; but as the tax upon malt, *i. e.*, barley, is so intimately connected with agricultural progress and prosperity, I am induced to do so, and mainly with the view of considering its practical bearings upon agriculturists, as growers of barley and consumers of malt.

The quantity of land annually coming under cultivation for barley in the United Kingdom of Great Britain and Ireland, is about 3,250,000 acres, for wheat about 4,500,000 acres. The average price of barley weighing 50 lbs. per bush., and, taking a course of years, is about 36s. per qr., or 4s. 6d. per bush. imperial, or 1s. 8d. and a fraction per stone imperial. The average price of wheat, weighing 60 lbs. per bush., is about 50s. per qr., or 6s. 3d. per bush. imperial, or 1s. 5½d. per stone—the difference combining weights and price, both being estimated at a fair average, will scarcely exceed twopences per stone. Wheat will always bear a relatively higher price than barley to that extent. For instance, 17 st. 2 lbs. (half a quarter) of wheat is worth, as above, 25s.; but of barley, the same weight, 17 st. 2 lbs., would scarcely be worth 22s., or fully 8s. difference, weight for weight; but by the quarter, at their respective weights named above, the value will be 50s. for wheat, and 36s. for barley.

The plain question arising from this statement is of course, Will the abolition of the malt tax cause a nearer approximation in price than the twopence per stone named above? Let us see. The flour of wheat is the chief sustenance of humanity in the British isles. Wheat bread is the universal food. Barley-flour, in the present day, is seldom used for making bread—hence wheat, or more properly wheat-flour, will always command a higher price than barley-flour meal; and as a necessary consequence, wheat will always bear a higher price than barley as food for man, a fact bearing against a closer approximation. But it is said that the abolition of this tax would largely increase the growth of barley for malting purposes, and thus enhance the price. The annual consumption of malt will average about 45,000,000 bushels, representing about 5,000,000 qrs. of barley. Barley, when malted, is increased in bulk, but decreased in weight—400 lbs. of barley will only yield from 250 to 300 lbs. of malt.

The 3,250,000 acres of land named above will probably average about 80 bushels of barley annually per acre, or, in round numbers, would produce about 100,000,000 bushels of barley. Now, 45,000,000 bushels are annually malted, leaving a balance of 55,000,000 bushels for other purposes. This certainly is a large per-centage to be taken for malting purposes, considering the qualities of barley always coming into the market, much of which cannot be suitable

for malting, because of the cost of malting, to say nothing of the tax. Barley made into malt costs about one shilling per bushel in the process of malting, and loses about one-third in weight—a question of no light importance in taking up the subject of fattening stock by the use of malt. Meal is undoubtedly one of the most nutritious and fattening foods that can be given to fattening stock. Will, then, the conversion of this meal into malt of greatly decreased weight compensate for this loss in weight of meal? Is it better food, and more fattening than meal? I can only say it has not been as yet satisfactorily proved to be so.

But supposing some 15,000,000 or 20,000,000 bushels more of barley in addition is malted, upon the supposed abolition or material reduction of the malt tax, would it cause a corresponding increase in the price of barley? The converse, from the record of experience in other cases, has been the fact. The great alteration sought for, and great benefit to be derived, would be in the reduction in the price of beer, the nation's chief beverage, and not an increase in the price of barley, the raw material. Take it as it now stands in respect to the tax and cost. Take barley for malting at 36s. per qr., malting 8s. per qr., tax 22s. 8d. per qr., total 66s. 8d. per qr. One quarter of malt will brew 108 gallons of good beer. Now take malt 66s. 8d., hops 8s., cost of brewing 13s. 4d. per qr., total 88s., or about 10d. per gallon, at which price any Burton or other brewer will supply good ale to any extent. Now take off the 22s. 8d. tax; the brewer can then afford to sell it at 8d. per gallon. Now far be it from me to speak lightly of such a reduction; it is an important one in the aggregate, but it cannot be any great boon to the poor consumer unless a greater reduction in price is effected by the change, and many things will tend to this course. Maltings would spring up everywhere, coarser barleys of good weights would be universally used, monopoly in brewing would be at an end, restrictions as to sale would be abolished, cheap beverages would be retailed of every quality, so that, "by hook or by crook," beer or ale would be brought down in price, and only the coarser qualities of barley would be advantaged, because the light and inferior barleys would meet a more extended competition from abroad: the consumer would reap the chief benefit.

It is of great importance to the whole kingdom that this national beverage should be retailed at as low a rate as possible. It enters largely into the calculations of every man of business who employs manual labour. The farmer, with whom I have chiefly now more to do, will find it a considerable item in his expenditure. In some districts, as in the West of England, it is truly oppressive—sixpence per day will not clear a Shropshire farmer of the cost for beer of each labourer. Now, taking this expenditure generally, and put it upon an acreage cost, it will be found to exceed 2s. 6d. per acre through the

county. The manufacturer is equally oppressed. This mode of payment of wages includes (and very properly, I think) a large per-centage in each day's work for beer. Beer comes largely into every calculation whenever manual work is to be done; there is no exemption. It seems to me as necessary to cheapen the cost of beer for the general good, as it does to cheapen the cost of bread, the real staff of life. I am no teetotaler: I detest excess in drink; but I do affirm that when any great manual effort is to be made, that a moderate quantity of good ale is almost indispensable to effect it. In my younger days I could "do a good day's work," but when almost superhuman efforts had to be made, as it occasionally must be in harvest work, then have I found great immediate benefit from a fair allowance of good ale as my beverage. I believe it is requisite to enable a man to make a long and continued daily effort; and he ought to have it, and have it in cheap form. It is at this point our barley-growers are at fault: their aim is to abolish the malt-tax in order to enhance the price of barley. Their aim should be, in conjunction with all classes desirous to promote the common comforts of the working men, to effect its abolition in order to cheapen our national beverage, so that our ordinary daily drink should be as free and unfettered as our daily bread.

One word relative to the increase of the growth of barley. I think too much stress must not be laid upon this

part of the question. It would unquestionably be increased in various ways; but it would not be found greatly to interfere with the present established rotations of cropping in the barley-growing districts; they cannot do better than they now do; but the chief increase would come from those parts where good barley cannot be satisfactorily produced. The fens, marshes, and rich soils of the country can only produce coarse qualities; consequently these soils are better employed in growing wheats, oats, beans, peas, &c.; but should coarse barleys come into demand, then these soils would be found to produce it, but chiefly then as a supernumerary crop, because of their adaptation for heavier cropping, as potatoes, or mangolds. Anyone conversant with rotations on rich soils will know that they can be devoted to more profitable uses than the growth of barley. Without going into elaborate arguments to prove my positions, I would say that the chief aim ought to be to get rid of the tax, in order to cheapen and surprisingly increase the consumption of beer, to improve the demand and render more equal the price of "barleys," to enable farmers to use malt indiscriminately for feeding purposes, to remove all restrictions upon malting or steeping barley for food, and to abolish it as one of the last and heaviest imposts upon the daily necessities of an industrious population, and an obnoxious and vexatious tax upon the capital and energies of the British farmer.

PISCICULTURE.

Fish culture is one of the most attractive topics of the season. In a country like this some difficulty is experienced at first sight in setting a boundary to its limits, since any "fair-one" or "fusty old bachelor" may set to work in a greenhouse (the parlour window will do equally well), either for profit, philanthropy, or amusement. "The following is the result of our labours last year" (i.e., in a greenhouse), "for the Thames Angling Preservation Society," says a writer in the *Times*: "We let loose on the shallows in the neighbourhood of Hampton, Sunbury, Walton, &c., 22,000 English trout, 6,000 Rhine salmon, 2,000 French trout, 3,000 ombre chevalier (char), and 2,000 grayling—in all 35,000 fish, being when let loose about the size of minnows. Oysters (adds the same instructive authority) are now 70s. a bushel, and one oyster has over a million young ones at a time. This requires looking to." Certainly so it does, and we shall be glad to hear the result of the writer's enterprise in this direction. To all who have a spring well, or the length of their leg of a running stream in "merry old England," Auld Scotland, or Onld Ireland, the subject comes home with a Christmas welcome.

Like all other topics in connection with land, the first question that calls for a practical solution is the old and familiar one, "Will it pay?" And this may at once be disposed of, under an affirmative answer, in every province of the kingdom.

Of course between "The Land's End" and Ultima Thule climatic and other differences exist in sufficient abundance to indicate a corresponding state of the "outgoings" and "incomings" under a pounds-shillings-and-pence view of the practice. This no doubt must be granted, generally speaking; but at the same time there is perhaps, if anything, less difference amongst fish, either in fresh or salt water, than in the case of cattle upon *terra firma*. In the form of an interrogatory the problem under consideration may be put thus—Whether will the artificial breeding of young fish be most in favour of the south or north, east or west?

In answering this question there will, doubtless, be some diversity of opinion. It is, however, one of those practical problems which experience alone can solve satisfactorily, and therefore the more prudent course is at once to refer it to her bar for judgment, and wait patiently for the award. In the meantime much may be done in more directions than one, to determine practical results.

In this, as in all other breeding establishments, the primary problem is to breed from *sound healthy fish*. The next in order involves the natural requirements of the ova, and young fish, so as to let the latter loose in our rivers, ponds, and seashores in a healthy state, experimentally trained to support themselves in accordance with Nature's laws. And the last topic we shall notice on this occasion is the purification of our rivers by the removal of all filth now allowed to flow into them that is noxious to the health of fish, and to supply them (our rivers) with what the natural requirements of fish demand.

Healthy fish ova, of every kind, is likely to become a commercial question of first-rate importance to amateur breeders, one that is perhaps liable to be attended with no little speculation and rough handling. Landowners who have healthy breeding grounds and a fine stock of fish will have no difficulty in supplying themselves, and also their neighbours, on reasonable terms; but there are many who are not thus situated, while experience may show that other kinds of fish may be more profitably grown than those with which their rivers and lakes are now thinly stocked. To obtain healthy ova of the best kind is evidently no secondary consideration, under such circumstances.

In a case of this kind, when a healthy oyster yields a million of young ones, the price of sound ova becomes a mere bagatelle, so that those who can supply the market with what it demands will stand inexorably in their own light if they do not respond to advantage.

If once the system was properly organised there ought then to be no difficulty experienced in getting healthy ova of the kind best adapted for every river, lake, and fish-pond in the kingdom; and those in charge of breeding establishments will soon learn to distinguish between the good and the bad.

Under the second head comparatively nothing requires to be said upon the process of depositing the ova; but the management of the fry on their first appearance, and so long as they are under artificial treatment, is, we aver, a part of the subject that invites discussion. If the quality and temperature of the water are adapted to the natural requirements of the young fish, it may be taken for granted that they are also suitable for the ova, and *vice versa*. But proper water, temperature, and light involve some very nice questions in fish culture, whatever may be the kind of fish, while different kinds of fish have evidently their own peculiar predilections

and requirements that must be attended to. In a question of this kind analogous examples—as the water of this or that river, which is known to afford comparatively healthy spawning ground—cannot be quoted as a *sine quâ non* argument, because there is hardly any river whose water is not less or more injured by noxious matter, and which consequently is susceptible of improvement. And besides this, we are liable to form an opinion upon the quality of the water from its appearance or chemical analysis, neither of which is satisfactory; for to these must be added the analysis of the microscope, to determine the animalcules which water always contains during the breeding months, under the natural system. And even when we get this length we only arrive at the dimisterial point of our subject, so to speak—the go-a-head question of progress, viz., Can art improve upon the most successful examples to be found in the natural world? And to this we unhesitatingly append an affirmative answer; for the "curse" that rests upon the land extends also to the water, and by sequence likewise the command "Repelish the earth." In this respect our rivers are sadly neglected at present, no less to our loss than discredit.

There will be no lack of both experience and opinion amongst "country gentlemen" as to what young fry like best when they first start into being, and what they should have during the successive stages of their minority up to the very day and hour when they are fit to be turned adrift to shift for themselves. Long ago our forefathers bred fish by the acre, scattering their crumbs daily upon the water to feed them, and weighing the produce carefully in the scales to test the veracity, as it were, of the practice; so that the annual balance-sheet was settled, as they now do, in the corresponding case of crack shorthorns and moutdown sheep. The practice will be found duly chronicled by Marshall, Young, and all the standard authorities of the last century, whose works might be quoted were it necessary. But examples of this kind, of which there are still many in active operation, are on the natural system, so that they do not exactly apply to the present artificial stage of existence. They, however, furnish much that is useful as a practical rule for in-door guidance, and what more is wanting must be left for experience to supply. Unfortunately, a very large proportion of fishponds are far below mediocrity, the fish in them being neither healthy nor prolific; consequently they are not even fit for a breeding stock: much less do they supply data for a more improved and artificial system; and this applies with equal force to the vast majority of our rivers, which are annually becoming more and more polluted from the increasing amount of noxious town sewage and other filth that is poured into them. The examples that furnish useful practical information are therefore few and far between; so that the experience of the past is rather of a negative than positive order, furnishing only what is wanting to make our present experience acceptable to the future. In other words, practically applied, those who have unhealthy ponds and rivers know from experience that the water in them is not adapted to the requirements of young fry under the artificial system of fish culture now beginning to be practised; while those who have healthy ponds and rivers have to weigh well the difference which the artificial system demands before the two can stand upon a footing of equality.

The practical solution of the question hinges, of course, upon water of a quality that contains the natural food of the fish in early life, under the artificial circumstances in which they are placed, and no doubt the dietary of the young fry admits of a considerable variety. Hungry fish, however, will catch at anything; while sickly ones, and those brought up on an abnormal quality of food, often eat what would poison healthy fish. Like those who are accustomed to eat large quantities of arsenic, the animal system becomes inured to it, as it were; whereas the same quantity given to a person otherwise accustomed would prove fatal. So is it with fish in water containing either noxious mineral matter in solution, or organic matter of a quality that does not agree with the peculiar nature of this or that species of fish, but the flesh of such fish is of an inferior quality, and sometimes poisonous, while they never breed abundantly. It is not, therefore, what young fish eat in this or that pond or river that must be taken as the rule, but what healthy fry prefer

when they have an abundant supply of food that keeps up the highest standard of health and quality of flesh.

It may safely be said that these are dietetic demands which few or no natural examples supply at the present time, so that art has to go-a-head, and in this be guided by a prudent experience, otherwise millions of the helpless little fry will come to a premature end before they have well crossed the threshold of life, while those that survive will have a deteriorated constitution. At present the sacrifice of fry-life in rivers far exceeds calculation: what between unhealthy male fish, imperfect ova, and the nameless adversities with which the natural system is surrounded, the position of the fry may not inaptly, by way of illustration, be said to lie between the poet's couplet—

"Death 't the front,
Damnation in the rear."

This very naturally brings us to the rescue—the purification of rivers, the last division of our subject. It is not at all surprising that they have in many cases become nearly depopulated of their finny race. How could it possibly be otherwise, when we are annually increasing the number of smoking furnaces and laboratories that are daily pouring their deadly poison into every running stream? It is rather a world-wide wonder that the life of a single fish has been spared; for the lethal dose from many manufactories is sufficiently strong to kill "the water-kalpy" himself. If there is such a place as a "hell upon earth" our finny tribes may in fairness be allowed to say, "it is our rivers!"

When our manufacturing towns are thus sending death to the very bottom of the deep sea from the estuary of every river in the kingdom, it is about high time our country gentlemen and others interested were bestirring themselves to a more active sense of duty. There are no doubt difficulties in the way, of no ordinary magnitude, besides dark labyrinths in the chemical world, that have never yet been trod—labyrinths which must of necessity be gone into, before any progress in the right direction can be made, with permanent advantage. But in granting this we only concede to the full force of the argument that the old "do-nothing rule" does not apply, and that *Union and action* is now the only motto that can be placed upon the common standard which all must follow who hope to gain the day. Town sewage, however, it must never be forgotten, is not the only source of poison to the young fry; the soluble compounds of copper and arsenic, now largely used for steeping wheat and in washing sheep, and which is also contained in many samples of artificial manures, are of themselves quite sufficient to do an incalculable amount of harm. And it must further be borne in mind that these latter are often injurious to game—the keeper's portion of which, i.e., that which cannot be used at the castle, finds its way to town as a sort of slow poison to game-loving dignitaries. We need not go further into detail in this direction; suffice it to say, in conclusion under this head, that these are all the enemies no less of the fry than of the landowners and the general public, and consequently must be conquered with a high hand.

The poisonous matter thus poured into our rivers is against everybody, and therefore it will be singularly anomalous to the general character of the present age should the strong arm of the Nation not be lifted up against it. Its use as a "steep" for wheat, "wash" for sheep, or its presence in artificial manures is highly discredit to the whole agricultural interest, for it is alike incompatible with the physiology of crops and cattle, being even sufficient to account for much of the bad health which both at the present time experience. We ourselves never used arsenical compounds or those of copper (blue vitriol), and would not do so were we to receive them for nothing, with 20s. per acre or per score of sheep into the bargain. (To their use in both cases we may return with more space). Its removal from town sewage and artificial manures may require statutory interference, and such ought to be applied for without delay or ceremony.

With regard to the improvement of our rivers and lakes in other respects, for the reception and growth of healthy young fish of the kind for which they are best adapted, there cannot be a doubt but what the proposition involves a highly remunerating field for the investment of capital, public and private, were the poisonous matter referred to in the previous paragraph kept out. Practically the question may be put thus: *What would 100,000 fry let loose into a river annually return as interest on their cost?*

ENGINEER.

M

RAILWAY LANDED ESTATES, AND RAILWAY PSEUDO SURVEYING, AS AFFECTING AGRICULTURE.

The manner agricultural estates and farms in our provinces, and landed properties in towns are intersected by railways, and the way the narrow strips of land which they occupy, forming a new and distinct species of landed property, are surveyed and taken possession of by railway companies, is a subject that is ripe for public discussion. Accordingly, in the columns of the *Times* aggrieved landowners and others are at issue *versus* surveyors, railway companies, &c. In the controversy it is generally admitted that the Land Clauses Act is defective in more respects than one, and therefore that it requires amendment; also that something should be done to place surveyors, railway companies, and the Board of Trade in what may not inaptly be termed "statutory harness," so as to make them responsible for their conduct in a manner similar to what other professional men and bodies are, it being argued by the above aggrieved parties that they are not so at present under existing statute. As the subject is likely to come before Parliament, the general question only is being discussed; but in the lengthened controversy that has already taken place in the leading as well as in the ordinary columns of the above paper, the case of the agricultural tenant and his landlord is not done justice to: while the erroneous system of land-surveying practised in laying out the line, &c., now too commonly, if not generally followed, is left wholly unnoticed. To these latter topics we shall confine our observations in this paper, and as they are also likely to go before Parliament, because obviously involved in the question of responsibility, our remarks will be, as much as possible, limited to the general question, *vis.*, *errors in surveying, for which the proposition would bring in surveyors as liable for the consequences.*

In a number of cases of railway valuations for severed and occupied lands which have come under our notice, justice was not done to the tenant-farmer in several respects.

First. It is always a very delicate thing for successful practical men to let their landlords and the public in general know the annual profit they have hitherto made on the lands that have been or are about to be taken from them. And in many instances which we could mention, very few would believe them were they to do so, while the future profits under steam culture and an improved system are much more difficult to estimate. In towns, if manufactories and shops are pulled down, the business, under proper management, may be carried on in another street. A few customers may be removed to a distance, and thus be lost: but the manner retail business is now conducted, by light carts and vehicles, this sometimes extends the sphere of trade, as the removed customer finds others in his new district, so that, instead of a loss, a general benefit may be gained. But it is otherwise with the agriculturists who have each to lose half-a-dozen acres of arable or pasture land. The bare reduction of the rent on this area, and a less sum allowed to cover tenants' profits for an indefinite term under good landlords than they make yearly, is not doing them even-handed justice; and yet how often are tenant-farmers glad to pocket this affront, and tacitly remain thankful that matters are not worse!

Secondly. When nooks, corners, and shapeless pieces of land are cut off from one field, and have to be added to another under a different system of husbandry, they may cost the tenant who receives them nearly their market value to place them in a profitable crop-bearing state. The question under consideration therefore resolves itself into that of the working capital of the tenant invested in the land. We have known a tenant-farmer, for example, have twenty pounds per acre invested in lime, manure, drainage, and labour; and until

this heavy investment was made, the land would not cover the rent and the ordinary expenses, leaving no interest on capital, or profit to cover professional skill and labour. The example is, no doubt, an exceptional one, as to the amount of investment; but the reader will bear in mind that such is the class of cases for which we have chiefly taken up the pen, and for which special statutory provision should be made. If, therefore, the agriculturist loses from £15 to £20 per acre on the six acres that have been taken from him by the railway company, and if he has to invest £20 per acre in a like area of shapeless corners (*vis.*, six acres), in order to make them worth anything to him, his position, as a professional man, is a very plain one, even granting that he holds under one of our best landlords. The amount of tenants' capital that has thus been sacrificed by railways in our provinces is a grievance of no ordinary magnitude; and considering the inestimable value of tenants' capital thus invested, and the sacred manner in which it should be respected by all, and protected by the Legislature, further sacrifices of this kind ought unquestionably to be avoided.

Thirdly. From the diagonal manner in which railways intersect fields and farms, an annual increase of expense in the tillage is incurred, and a greater area of land placed under headlands and fences. The loss hitherto sustained by heretofore culture has been considerable under each of these three heads and under steam it will be far greater. Losses of this kind it is true, are not very easily estimated at their real value, but that is no reason why they should be passed over altogether as they too frequently are, by railway surveyors, and even by the landowners to which the lands belong, and on whom as annual loss ultimately falls.

In very many cases farms will have to be wholly redivided into rectangular fields before they can be cultivated by steam to the greatest advantage, or on equal terms to what they could have been had they not been intersected by the railways. If the fields are lying in permanent grass the present loss may not be so great; but it must be borne in mind by valuers, in the valuation of land under such circumstances, that the grand effect of steam will be the breaking-up of a large area of such pasture-land to aration, when the loss will then be experienced. The too common maxim of shuffling past the whole affair in the softest, smoothest, and cheapest method possible is out of date, and altogether unworthy of the present enlightened age. The landlord and tenant may be both in their dotage, poor as crows at Christmas, and need to a proverb; but these, weighty arguments as they are, form no valid grounds why the interest of the heir-apparent and that of the young farmer should thus be sacrificed upon such an altar. Steam will work wonders on this sort of land, increasing its marketable value to the landlord in many cases fourfold, and its productive value to the tenant upwards of tenfold. In point of fact, such results, startling as they may appear to some surveyors and holders of railway stock, have already been realized; so that those who trample "tenant-rights" and landlord-rights under their feet, in blind obedience to any force of circumstances that may be brought to bear upon them by self-interest or railway dominance, ought to be held responsible for their conduct. Land for agricultural purposes, it must ever be borne in remembrance, has its intrinsic value, apart altogether from what its present occupiers make of it; and therefore to award what the latter will accept may be doing an act of injustice towards those who are equally interested in the valuation. In the case of entailed property, some very nice legal questions may be involved, by land being let below its real value, in order to accommodate a needy landlord with all that can be got from a railway company; but into the details of such we need not enter.

Fourthly. When railways are first opened, they prove a source of great annoyance to grazing cattle, plough teams, and roadsters; and this often continues for an indefinite length of time. Cattle are thus taught to shy—a vice which is often handed down from one race to another, in consequence of old

and young aying together. To the passer-by it may appear to be merely a wanton freak of rather an amusing character than otherwise; but to the owner it involves a very serious loss, whether his stock be a breeding one or fattening for the shambles. The sacrifice is far heavier than is generally imagined, even by some practical farmers; and the finer the improvement of the breed, and the better the quality of the animals, the greater will be the loss. It is one of those losses, too, that cannot be practically estimated at the time when the other relations require to be made, as the railway must be in active preparation for some time before it can be seen in all its bearings. It is, therefore, a loss that is generally passed over, or which may be balanced by the advantages *per contra* which farmers gain by railways, and these in most cases it will fully cover. Is a valuation it ought never to be lost sight of, for this express *per contra* purpose.

Fifthly. Crossings over, under, or on a level with the rails, frequently entail upon the farmer an extra expense for boys to keep the gates, in the latter case, and a boy and a horse, and sometimes two boys and two horses, to trace the loaded carts in hay and corn harvest, and manure-carts in seed-time, up the incline. In catchy harvest weather the loss under this head is often greater than is generally estimated, there being a loss on the harvested crop that has to be added to the expenses of the horses and boys.

Now, passing over incidental mishaps from cattle getting upon the line at crossings on a level with the rails, sparks from the chimneys of the engines, &c., the above five examples, of themselves, form a case of grievances enough to make any independent, spirited farmer grumble, and something more. Our more versatile town's-people always make out a fine readable case of their own, alike whether it is the Metropolis or some old rotten borough. To them it is always harvest-time, provided the wheel of Fortune moves merrily round, from one year's end to the other; but the farmer has only one crop per annum, and much catching weather often before that can be secured. In each of the above examples there is, no doubt, a wide difference between tenants-at-will and those holding on long terms; but into details of this kind we need not go, as they can readily be supplied by the reader. As to the case of the landlord, it is for the most part identical with that of the tenant. Eventually, however, the whole loss has a tendency, so to speak, to fall upon his pocket. It is, therefore, his duty and interest to fight the parliamentary battle in getting surveyors and railway companies made responsible, and the necessary redress of grievances in other respects. In those exceptional cases (which, by-the-by, are far too common) where yearly tenants are taken the advantage of, and in which the whole sum realized from the railway company goes into the coffers of the landlord, the transaction is tantamount to an increase of rent, under circumstances of a highly reprehensible character in the outset, attended with a *per contra* day of reckoning in the future, where the landlord has to pay back his hastily-got valuation, sum and interest, it may be, twice-told. In this, as in all other screwing cases, the narrow-minded stand aside in their own light, whether landlords, tenants, or railway companies.

We now come to the second and more professional part of our subject, viz., the levelling, surveying, and setting out of railways through estates, farms, and fields. Like the survey and setting out of the inclined-planes of the ancient geometer of Chaldea, Egypt, Palestine, &c., the work belongs to the same branch of land-surveying as river and road surveying, and the apportioning of land *i. e.*, narrow strip for a railway. It has been nicknamed "Railway Engineering," "Land and Engineering Surveying," by Civil Engineers, and a host of land-surveyors who have been metamorphosed into Civil Engineers in order to qualify them for railway surveying!! Volumes, too, have been written giving plans and sections of actual surveys, with the good intention no doubt of teaching the rising generation practically; but they form an anomaly by no means easily reconciled with the intelligence of the present time, much less its requirements, so that the sooner they are virtually shelved by an act of Parliament (for nothing less will meet the case) the better for all parties interested, railway companies in particular. All our practical land-surveyors are familiar with the professional maxim that when the field operations are correct "the lines close," and when

they do not close an error must exist somewhere in the "dimensions." But in our modern railway surveying this old familiar standard maxim is set at naught in the most unceremonious manner possible, for right or wrong "the lines close," so that the whole process of plotting goes "click, clack," like a clock, both upon the vertical and horizontal planes, it being of course presumption to suppose an error in the field operations of a land surveyor when once fairly metamorphosed into a Civil Engineer?! It has been our duty oftener than once to make exposures in the columns of the *Mark-Lane Express* of what may be termed *dogmatical fallacy in applied mathematics* in connexion with land; but the present "Civil Engineers' Railway Engineering in our Fields" is about the grossest; therefore we shall as usual dispose of it by example, thus:

A plan and section of an actual survey of a railway line before us, in a work which has gone through many editions (and, we may add, closely resembles those of other works.) Superficially examined they have a passing appearance, and to those not practically acquainted with land-surveying, both plan and section would be pronounced "very good;" but the moment they come under the eye of the professional surveyor, versed in the higher branches of applied mathematics, he sees at the first glance that the lines do not close, and when he goes into the details he finds that field operations have been performed on erroneous principles, *i. e.*, not in accordance with mathematical rule or the elements of geometry as taught at our Universities. On this plan, for instance, one line, a curve gradient, is too short by from four to five chains, while the "datum line" on the section is from six to seven chains short, and consequently the other lines in connection with it. Now, as the section is plotted from the "field book," or lines measured in the field, it follows that the measurements are wrong; and when we examine the method on which the lines have been measured in the field, for both plan and section, we then find out the true source of the errors—the whole survey or field operations being conducted on erroneous principles. Not that the work has been hastily in order to be cheaply performed, the very reverse being true. No doubt many of our readers through whose farms and estates railways pass must have been grieved to see the non-professional manner surveys were made, and the enormous waste of time and expense thus incurred, and injury thereby inflicted upon all parties interested; and upon none more than upon railway companies.

Again, *the lines not closing* is only one error, and far from being the more amusing part of our story; for, in the work before us, we have line upon line and page after page of analytical proof showing that the lines are correct, the long algebraical demonstration finishing of course as usual with the very significant Q. E. D.!

But this is not all, or even the worst part of the exposé. Thus, a curve gradient forming a segment of a circle upon the plan is a section of a cylinder upon the ground or in the field, the former being upon the horizontal plane, and the latter upon the hypotenusal plane; and, if we mistake not, many more civil engineers than the authors of the works before us are not more than practically versant with this fact in land surveying. But be this as it may, the authors in question fall somewhat into a humbling professional blunder, when by a very lengthy and prolix algebraical demonstration they prove the bases of a cylinder equal to its section; for long long ago Archimedes and Apollonius, two ancient geometers, proved the contrary, no less to the satisfaction of their day than ours. And, *vice versa*, if a curve gradient is set out as a segment of circle upon the ground or hypotenusal plane, then it cannot be represented as such upon the plan or horizontal plane.

Our subject is thus a broad one; but we need not go further into it at present. Enough we hope has been said to justify those landowners, agriculturists, and others now loudly complaining, in going to Parliament with their case; for of the hundreds of railway plans laid before the legislature this year (1864) we question if there is one that will bear a close investigation. This no doubt involves a very heavy charge, but we make it without fear of contradiction; and, therefore, railway companies stand greatly in their own light if they do not join landowners in getting statutory redress, so as to enforce an accurate system of railway surveying, and to ensure responsible surveyors qualified to do justice to all parties.

PROFESSOR ANDERSON ON THE ROTATION OF CROPS.
HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

On Wednesday, December 16, a meeting of the members of the Highland and Agricultural Society took place in the Society's Museum, Edinburgh. There was a large attendance, and the chair was occupied by Mr. Hunter, of Thurston. Professor Anderson delivered an address on "Some Questions connected with the Rotation of Crops."

DR. ANDERSON said: There is probably nothing which has been more frequently insisted on, of late years, than the advantages which agriculture has already and is yet destined to derive from the active co-operation of science and practice, nor will any one—now that the true relation of the two are recognised and it is understood that they are not antagonistic, but advance in the same direction, though by different paths—be inclined to doubt the importance of the progress agriculture has made since it came to be regarded as a scientific art. Differences of opinion may no doubt exist as to the extent of the influence which science has exerted on its progress; but no one can hesitate to attribute to it a certain effect, while those who are most familiar with the subject, and most capable of following science through the details of practice, will most fully recognise the changes it has effected. The results which have occurred are exactly those which may be anticipated when an art that has been slowly advanced by the gradual accumulation of experience in a purely empirical manner calls in to its aid a branch or branches of knowledge which have already examined the same subject from a different point of view, for it thus obtains new tools, which, if properly used, enable it to accomplish what would have been impossible without their assistance. The instant an art begins to be cultivated in a scientific spirit, it is no longer content with the mere observation of facts, but seeks for their explanation, and is thus enabled to make them the starting-point of further progress. Up to the end of the last or beginning of the present century, science and practical agriculture had never come in contact, and the former had shot far a-head of the latter, so that when Davy and other chemists directed their attention to agricultural questions they were able to throw light on much that was previously obscure, and to make many important practical suggestions, the utility of which is best proved by their thorough incorporation with the daily practice of agriculture. These, and the subsequent statements of Liebig, have led to the impression that science must be in a condition to unravel all the difficulties encountered in the field. But this is only possible in the event of science maintaining its position in advance of practice; and though this has hitherto and probably always will be the case in a general sense, yet it is obvious that there may be circumstances under which the opposite may occur, for practice may be led into particular channels of observation which science has no special inducement to follow, and a whole mass of facts may be accumulated which it is unable at once to explain, and which it can only clear up by a series of elaborate inquiries made for that special purpose. In addressing the members of the Highland Society, I have more than once adverted to this point, and explained that as the practice of agriculture is not perfect, neither are the sciences on which it depends, and that there are many matters still obscure, and for the full explanation of which we may have to wait until much additional information is obtained. The truth is that while science in the main is in advance of practice, and has discovered many facts for which we have been, as yet, unable to find practical use, and which we are, therefore, in our ignorance, pleased to call unpractical, there are other facts established by empirical observations in the earliest periods of agriculture for which no satisfactory explanation has yet been discovered. Among these subjects I reckon the rotation of crops, to some points in relation to which I propose to direct your attention on the present occasion. I do not intend to discuss it in full, for that would carry me far beyond the limits of an address, but rather to point out some of the difficulties encountered; to show how the ex-

planations hitherto offered—some of which are extremely ingenious—have failed, as I cannot help thinking they have done, and to suggest the importance of minute observations of all facts likely to throw light upon it. It is unnecessary to refer to the early period at which the necessity for a rotation of crops was observed, further than to remark that the Romans had some idea of it, and that it had reached a condition not very different—in principle, at least—from its present state, long before any attempt was made to study agriculture as a science. The earlier explanations given were of a very loose and unsatisfactory character. Even Davy himself, usually so clear and lucid, scarcely throwing any light upon it, and we owe to DeCandolle the first consistent view of the subject. He supposed that plants growing on the soil are entirely devoid of the power of selecting their food, but suck up by the roots everything they meet with, and these substances, circulating through them, those which are useful are retained, and those which it cannot assimilate are again excreted by the roots, that is, by the same organs by which they were originally absorbed. After the plant had grown for some time in the soil, these excrementary substances accumulated in that part of it occupied by the roots in such quantity as to impede its growth. His idea appears to have been that those substances were not in themselves injurious to the plant, but rather that being accumulated in the soil the plant obtained among the substances it absorbed a disproportionately large quantity of the materials it was incapable of assimilating, and too small an amount of those which constituted its food, and therefore languished and died. But the substances which one plant rejected he supposed to be perfectly capable of assimilation by another, so that the growth of the first not only formed no impediment to the second, but might actually promote it by gathering together the very elements it required. It is to be observed that he considered the substances which acted in this way to be normal constituents of the soil which were not poisonous to the plant, but exerted a negative influence, by taking the place of those it was capable of digesting and turning to account. This view was subsequently modified by Macaire Princep, who made a series of experiments by growing plants in water, and examining the substances excreted by the roots. He found that peas and beans communicated a brown colour to the water in which they grew; that the little sponge (*Euphorba pepala*) excreted a green resin of very acrid taste, and several other plants produced particular substances distinguished by taste or smell. When the plant which had produced these excretions was withdrawn, and replaced by another of the same kind, it refused to grow, although no such effect was produced on a different species. A corn plant, for example, would not only grow, but flourish in the water which refused to support a pea or bean. It is to be noticed that the views entertained by these two observers were not identical, for the excretion obtained by Macaire Princep were not constituents of the soil, but substances elaborated within the plant and got rid of through the roots. They had, however, this much in common that both assumed the existence in the soil of substances excreted by the plants, which prevented the growth of the same but did not affect that of another species. These poisonous matters, however, were supposed to be capable of decomposition, and thus a soil which had become poisonous to a particular plant after a time lost its noxious effect, and became capable of producing it again. This view is undoubtedly extremely ingenious, and explains many facts; but it is totally opposed to many others equally familiar and well established, that it is surprising that it should ever have been with the support it actually received. If it were correct it ought to be entirely impossible to obtain two or more successive crops of the same kind, while in reality nothing is easier. It may not generally be economically advantageous to do so, but by proper manuring it is perfectly possible to obtain two successive wheat or barley crops on a

same soil; and this is even sometimes done, although I need scarcely say it is not considered good farming. In this there is certainly nothing incompatible with Decandolle's view, because it may be said that the manure used restores, more or less completely, the balance between assimilable and unassimilable substances in the soil, and the plant is no longer compelled to take the latter in disproportionate quantity. But how are we to explain those cases in which crop after crop of wheat has been taken from the same soil, as was done with the virgin soils of America, and is still practised in Hungary and some other countries? If Maccare Princep's view is correct, two successive crops of the same kind ought to be an impossibility, for the poison which prevents the growth of the second is there, and cannot do otherwise than act. His explanation is, therefore, incompatible with facts observed in the field, and it has not stood the test of experimental investigation. Another observer—Braconnot—repeated Princep's experiments, and found that if the roots of the plants grown in water were entire, nothing was excreted, but that if they were injured, substances similar to those observed by Princep were soon found in the waters. If it be the proper juices of the plants which were thus excreted, it is quite obvious that no poisonous effects can be produced by them, for in the process of green manuring, an entire crop is ploughed into the soil without injury to another of the same kind succeeding it. The views of Decandolle and Maccare Princep therefore fell to the ground, and were replaced by the much more probable idea that successive crops refuse to grow, not on account of the accumulation of any substances in the soil, but because they remove from it some elements necessary to their growth. This explanation is, in the first place, much more natural than the other, and it accordingly appears to have occurred to many observers, and was used to explain the appearance of fairy rings by supposing the toadstools took from the soil some substances which they required, and no longer finding them, advanced from centre to circumference in search of the necessary food. The nature of the substances thus removed was not then understood, and we owe to Liebig the development of this view, which became possible when the facts of chemistry had increased. He insisted more strongly than any one before his time on the importance of the mineral constituents of plants. The older chemists believed that these substances were quite fortuitous, and that the plant sucked up from the soil like a sponge everything it came in contact with, and Decandolle's view was so far founded on this idea. But the numerous ash analyses which had been made in the interval between his time and that of Liebig enabled the latter to show that this was not correct. Now, when plants are burned it is found that the composition of ash they leave behind is not consistent with the idea that they work up anything their roots encounter in the soil, but that each plant takes up those substances which it more particularly requires, and yields an ash which is about identical in composition, whatever be the soil in which it grew. After a sufficient number of analyses of the ash had been accumulated, Liebig began to classify plants according to the preponderating constituents of their mineral portion. It is found that in the straw of a cereal for instance, a proportion yields an ash of which about two-thirds of the ash consists of silica, and that of the grasses generally is very similar in composition. But when other plants are burnt, such as the tobacco plant, pea-straw, or clover, the ash they yield is extremely poor in silica, but rich in lime. And again, if we burn a portion of the turnip plant, the ash contains abundance of potash, while the lime and silica are there in only small quantities. These facts seemed to afford an indication of necessity for a rotation of crops. It is well known that a number of the constituents which plants require are found in the soil, in an available condition, in extremely small quantities—that silica, for example, which is an abundant element of every soil, is not all in a condition in which the plant can absorb and assimilate it, but that only a minute fraction of that found in it is in a condition fitted for being taken up by the plant. If a cereal, however, is grown, it takes up at once the silica which it requires—it exhausts a great part of the supply of that element existing in the soil and in an available form; hence a similar crop growing there cannot flourish, because it does not receive that substance in sufficient quantity. If, however, a plant which requires no silica be grown after one which requires a great deal of it, then gradual changes take place in

the soil, converting a quantity of the unavailable silica into an available condition, and when a certain time has elapsed there has been a sufficient accumulation of that particular substance to serve for the supply of another crop. So, again, if a lime plant be grown with success, it may so completely exhaust the available lime that another crop immediately following it cannot grow; but if, after one or two seasons, another supply of that element has been brought into an available condition, advantage may be taken of it by changing the crop. It is obvious that this is a very ingenious explanation of the necessity of a rotation of crops; and if it be carried still farther, not merely restricting it to the ash of the plant, but including also their organic constituents, it is found that there are circumstances bearing on it in relation to them also. If, for example, we grow the turnip, which is a broad-leaved plant, and after it take a cereal or narrow-leaved plant which exposes a very small surface of green matter to the atmosphere, the conditions of growth are very different in the two cases. It is well known that certain constituents of plants are absorbed from the air, and it is generally supposed that the broad-leaved plants take from it a larger quantity of carbonic acid (and it is alleged also of nitrogen, though that is more doubtful) than the narrow-leaved plants; that the turnip, which may be taken as an example of the former, is mainly dependent on the air, and a cereal, which exemplifies the latter class, is mainly dependent on the soil. A cereal, it is therefore supposed, cannot be grown for a succession of years without manure, because it exhausts very rapidly the supply of the particular organic food, although it exists in the soil. But if this view, which is unquestionably an extremely ingenious one, be carefully examined, we find many difficulties in the way. In the first place, the distinctions which Liebig in the first instance drew between the substances containing silica and so forth, is by no means so marked as was originally supposed. A cereal no doubt takes silica from the soil in large quantities; but if we look at other plants, such as the bean, the turnip, &c. it is seen there is far from being that amount of difference that might be expected. Liebig, for instance, calls the bean a lime plant, but it can only be so described if we look simply at the straw by which the bean is supported. The error lay in not comparing the entire plants with one another, but only one of their organs. In bean-straw no doubt the quantity of lime is very large; but if we look at the seed of the bean itself, we find that it is very poor in lime. And hence it is clearly necessary not to look at the stems only, but at the entire plant, and not even at the entire plant only, but at the total produce per acre. In fact, it is not enough to say that one plant is rich in lime and another poor in it; the question is, what quantity of lime is taken from an acre of land? and when by different plants an average crop of the ordinary farm plants is examined, it turns out that the relative quantities of different mineral matters removed from the soil does not differ so much as we might anticipate. No doubt cereals differ from every other plant, in so much as they take a large quantity of silica: but on the other hand, if we come to examine the effect of the repeated growth of crops, it appears that the cereals are less affected by repetition on the same soil than any other kind of crop whatever, although, if this view we are discussing be correct, they ought to be most immediately affected by it. There are many other facts which strike at the root of this view. If it be true that the successful growth of any particular plant depends on its finding in the soil a very large quantity of the particular substances it requires, it must necessarily follow that if we begin the rotation with the turnip and produce annually a large crop, we necessarily remove from the soil a very large quantity of mineral matters, and we ought to impoverish the soil to an appreciable extent, and render it less capable of supporting the subsequent crops of the rotation; while on the other hand, if the turnip crop be small, it would follow that the quantity of these mineral matters removed from the soil being also small, the soil itself should be in a condition the next year to produce a larger crop, whatever that crop may be, than it would have been if it had produced an extremely large crop of turnips. In practice, however, the very reverse is the case. I apprehend that no point is better established than this—that if a farmer commences his rotation with a poor crop, all those that follow are also small; although under these very circumstances, if this explanation be correct, they should be the largest. Looking still farther into the matter, we encounter a great number of facts, some of them of an extremely remarkable

kind, which require consideration. The points to which I am about to advert are many of them of an obscure kind, and I shall have some difficulty in putting them in a clear and satisfactory way before you. They are mainly deducible from some experiments and observations made by Messrs. Lawes and Gilbert. These observers, as is well known, have experimented with the same crop on the same soil for a number of years, both with and without manure, and they find it possible to grow wheat for sixteen years in succession with comparatively little diminution in the amount of the crop. It may be said that this continued growth of wheat is due to the fact that their soil is extremely rich in the substances that wheat requires. But see what occurs when another plant is taken. Beans may be cultivated for twelve successive years, and a crop may be produced, but not without a very conspicuous diminution. If the quantity of nitrogen in the bean be taken as the test of the crop, it appears that during twelve successive years it will draw from the soil an average of nearly 48lbs. weight of nitrogen; but the first six crops of beans averaged 70lbs., and the last six, 26lbs. of nitrogen, so that there is a very considerable diminution in the quantity. But see how important is the difference in the total quantity. The wheat crop during these successive years removed on the average only about 24lbs. of nitrogen, while the beans abstracted 47lbs., or nearly twice as much. In the case of clover again, they have found that by no means can they produce more than three or four successive crops. They may manure the soil as they please, apply to it any kind or any quantity of plant food, but nothing they can do will enable them to increase the number of crops of that plant which can be grown in succession. No principle or system of preparing or manuring the land that they could adopt had any effect, and the diminution in the amount of produce is extremely remarkable, for they found that the second crop of clover, with wheat intervening, was only about one-ninth of that produced in the first year. Here it is very clear that the amount of plant food did not affect the produce, and that a supply of the necessary elements is not all that is required. Going still further, more remarkable results attract our attention. When ten crops of beans were grown, one after another, without manure of any kind, they found that the average of nitrogen removed from the soil was 34.7 lbs. every year. If they employed mineral manure, the average quantity removed was 51.1 lbs. Now, with ten crops of wheat, taken in succession, without manure, the average quantity of nitrogen drawn from the soil was 23.4 lbs. But if they took five crops, with five intervening years of fallow, they found at the end of the ten years that the five crops of wheat had withdrawn almost the same quantity of nitrogen as the ten crops in ten successive years—so that, alternating a year of fallow with every year of wheat had the effect of doubling the amount of the crop. The total amount of nitrogen removed by the ten crops in these ten successive years was 234 lbs., and the total amount removed in the five years of fallow, with five of crop, was 219.3 lbs.—or a difference of about 14 lbs. Each crop in the ten successive years drew 23.4 lbs., and with five years of fallow and five years of crop, the average amount drawn was 43.9, and dividing these by two, we get the average over the ten years, which was 21.9 lbs. The experimenters next proceeded to grow wheat with alternate crops of beans—five crops of wheat and five of beans in place of the fallow as in the preceding experiment. Now, these five crops of wheat alternated with those of beans yielded 235lbs. of nitrogen by the end of the ten years—just about the same as when the ten crops successively were grown; but during the intermediate years, the beans were engaged in abstracting nitrogen from the soil and air, and they had actually withdrawn 48.9lbs. of nitrogen every year, so that the taking away of that element from the soil by the five crops of wheat did not prevent the beans taking exactly the quantity which they required. You will thus perceive that the ten crops of wheat contained a certain quantity of nitrogen—that five crops of wheat with five of fallow contained about the same quantity, and that five crops of wheat and five of beans took much more than double the quantity, for the wheat took as much as if there had been no beans, and the beans took the quantity they required. Now here is a fact of which we had no previous definite idea at all. I do not apprehend that practice offers us any definite facts of this kind, and in making these experiments, Messrs. Lawes and Gilbert have opened up an entirely new field of observation. In the experiments to which I have

referred, the soil was left in its original condition, no manure being employed; but they found that if they added manure, especially mineral manure, the result was that the five crops of wheat when alternated with five crops of beans, gave 207lbs. of nitrogen, and the five crops of beans which alternated with them yielded 227.2, the proportion, in this case, being not larger, but actually smaller than where no mineral manure were employed. Now, how are we to explain this? If we look at it, we see very distinctly that the question with regard to the mineral matters contained in the manure throw no light whatever upon it. Here is a plant, the wheat which takes a certain quantity of material from the soil, and it does not seem to matter how that wheat is grown. It is immaterial whether ten successive crops be taken or five, with beans intervening exactly the same result is obtained; and if these be thrust in between five of wheat, five of another plant, we get all its produce, as it were, over and above the wheat. It would appear, then, that there are some advantages in growing crops alternated in this way, for beans when grown ten times successively do not yield so large a quantity as when put between successive crops of wheat. Take these facts how we may, it must be admitted that they seem to indicate that the rotation of crops is a far more complicated question than has been supposed, and that if a proper explanation is to be found for it, a class of facts to which but little attention has been hitherto paid must be taken into consideration. It appears indubitable that it is not a question to be explained by merely looking to the chemical nature of the food to be supplied to plants; that it is not a purely chemical, but to a great extent a physiological question; and that it is not enough to look at the plants as machines taking in a certain quantity of food, but that they must be viewed as beings endowed with certain functions which are not the same in every particular plant. And if we come to look at it in this point of view, a very great deal must be considered as depending on the manner in which the plant grows. I think one reason why alternation of crops is beneficial is, that certain crops spread their roots in the superficial, while others penetrate into the deeper layers of the soil, so that a shallow-rooted crop exhausts from the upper part of the soil certain of the substances which it requires, and another crop which must derive its food from the same layer following it does not find these substances in the sufficient quantity, and it becomes necessary to thus take advantage of the supplies contained in the lower soil by growing a deep-rooted immediately after a shallow-rooted plant, until such time as a new supply of available food has accumulated at the upper part, and this is what actually occurs in practice, a shallow generally following a deep-rooted plant. But even this is far from explaining all the facts observed, and it seems necessary to go a little farther and look upon some plants as having a much greater assimilative power than others—that such a crop as the turnip, for example, can readily take food from the soil when in a condition in which it may be totally inaccessible to another plant; and I am inclined to think that a great deal of the failure of the clover plant is due to this, and that the clover may be described as a plant of nice digestion, which requires to have its food in certain conditions in which it exists in the soil in but small quantities, and this would help to explain why we seldom see clover abundant in the second year. The land may be well planted with it the first year, but by-and-bye it disappears, and next season perhaps the field shows not the slightest trace of it, although it supplies abundant food for grasses, and would support cereals very readily if they were grown upon it. There are a great many other points which appear to me to be worthy of consideration, but you will observe that the great difficulty we have in regard to this subject is that we must talk of it to a great extent in a speculative way. There are few definite facts to go upon, and I feel very strongly that until they are supplied it is impossible to explain or even discuss many points relating to it. It may also be anticipated that much time must elapse before the necessary facts are amassed, for they are not of a kind likely to be obtained in the ordinary practice of agriculture. They must be obtained by actual deliberate experiments made for the purpose—not confined to one, but extending over many years—and requiring great care and a very great expenditure. They should be something like these experiments of Mr. Lawes—made with great skill, carried on during successive seasons, at a cost of time and labour on which few private individuals, and none of our pre-

sent public institutions, could possibly venture. Therein lies the great difficulty we have to encounter. I have not attempted here to discuss this subject in its great practical bearings. I feel that if I had done so I should have entered on a subject in which I am rather fitted to be a learner than a teacher; but I am sure there are many gentlemen present who would be

able to throw out some important practical suggestions which may occur to them on hearing what I have now said.

Dr. Anderson concluded amid loud applause, and no remarks being made on the subject of the paper, he received, on the motion of the chairman, a hearty vote of thanks for his address.

WHEAT PRICES FOR TWENTY YEARS.

It is extremely interesting to note the fluctuations which the price of our most important cereal has undergone in the twenty years ending December 31, 1863. First, in the five years immediately preceding the adoption of Sir R. Peel's free trade measures, the variation per month was as follows:—

Month	1844	1845	1846	1847	1848
	s. d.	s. d.	s. d.	s. d.	s. d.
January	51 1	45 8	55 6	69 11	50 3
February	53 5	45 4	54 7	72 10	50 9
March	56 3	45 3	54 10	75 4	50 5
April	55 4	46 1	55 9	75 4	50 8
May	55 6	45 11	55 9	88 9	49 0
June	55 7	47 10	52 1	92 10	47 7
July	54 4	49 7	51 5	79 2	48 7
August	50 0	55 9	46 3	66 3	50 11
September	46 4	53 10	56 10	52 9	54 2
October	46 1	57 10	58 7	54 9	51 9
November	45 11	58 10	60 7	53 8	51 9
December	46 3	57 10	60 3	52 3	48 2
Average	57 3	50 10	54 8	69 9	50 6

The general average of these five years was thus 56s. 5d.; in the next quinquennial period, when free trade measures came into force, it fell to 48s. 5d. Thus the course of prices in these five years of change and depression was:—

Month	1849	1850	1851	1852	1853
	s. d.	s. d.	s. d.	s. d.	s. d.
January	45 1	40 6	38 1	38 4	46 0
February	46 1	38 4	37 8	42 2	45 2
March	44 11	38 1	37 3	43 6	45 4
April	44 9	37 10	39 0	41 0	44 6
May	45 4	38 9	38 8	40 9	44 2
June	44 7	40 2	40 7	40 9	44 9
July	48 8	42 0	42 11	40 10	49 9
August	46 6	42 8	40 11	40 11	51 7
September	43 3	42 9	37 10	41 9	54 6
October	41 7	41 0	35 11	38 6	65 11
November	40 3	40 1	36 6	39 11	72 5
December	39 3	39 3	37 5	43 3	71 7
Average	44 3	40 8	38 6	40 9	53 3

The last few months included in this comparison witnessed ominous threatening of a great European struggle, in consequence of which one of the contending parties, Russia, would be likely to cease sending us the surplus produce of her Southern provinces. The result was that 1854, 1855, and 1856 were years of high prices, as the following figures show:—

Month	1854	1855	1856
	s. d.	s. d.	s. d.
January	80 1	72 5	76 6
February	80 10	70 4	72 6
March	78 9	67 8	69 11
April	77 2	68 5	68 8
May	78 10	73 11	68 0
June	78 8	76 11	69 6
July	73 1	76 5	76 1
August	63 7	76 3	72 10
September	56 7	75 9	67 10
October	57 11	77 0	65 5
November	71 8	80 10	64 1
December	71 3	80 1	60 3
Average	73 5	74 8	69 2

Peace having returned in April, 1856, prices soon began to descend; nevertheless, the average for the three years was 72s. 1d. The Franco-Austrian war of 1859 did not at all disturb the course of prices, which remained at a low point until the food crisis in France caused some alarm in the autumn

of 1861. Annexed are the fluctuations month by month in the five years ending 1861:

Month	1857	1858	1859	1860	1861
	s. d.	s. d.	s. d.	s. d.	s. d.
January	58 7	88 0	40 11	43 11	59 9
February	58 0	45 5	40 9	43 10	54 6
March	55 6	45 4	40 2	45 4	54 2
April	58 8	43 9	41 4	49 4	56 4
May	56 7	44 6	51 3	52 4	54 11
June	60 1	44 0	50 9	55 6	53 5
July	63 4	44 7	45 6	57 2	50 7
August	59 6	44 4	44 0	59 5	51 0
September	57 0	44 10	42 7	60 4	53 0
October	55 5	42 8	42 7	59 11	56 9
November	51 3	41 8	43 2	58 2	59 11
December	48 7	40 7	43 11	58 0	60 11
Average	56 4	44 2	45 9	53 3	55 4

The average for the five years was thus 50s. 7d. We have now arrived at such a comparatively recent period that it is scarcely necessary to make any remark with reference to it. We will simply detail, then, the monthly fluctuations of 1862 and 1863:

MONTH	1862	1863
	s. d.	s. d.
January	61 4	47 4
February	59 11	46 6
March	59 2	45 5
April	57 11	45 6
May	57 5	46 3
June	54 5	46 9
July	57 0	46 9
August	57 9	46 0
September	53 6	44 2
October	49 5	40 11
November	48 8	40 0
December	46 4	40 10
Average	55 5	44 8

The general results of the 20 years may, therefore, be summed up thus:

Year.	Av. price.	Year.	Av. price.	Year.	Av. price.
1844	51 8	1851	38 6	1858	44 2
1845	50 10	1852	40 9	1859	43 9
1846	54 8	1853	53 8	1860	53 3
1847	69 9	1854	72 5	1861	55 4
1848	50 6	1855	74 8	1862	55 5
1849	44 3	1856	69 2	1863	44 8
1850	40 8	1857	56 4		

In the first ten years—five of which passed away under a protectionist régime—the average price of wheat was 49s. 5d. per qr., while in the second ten years, in which a free-trade policy was triumphant, it was 56s. 11d. per qr.; so that the British farmer, who considered himself ruined in 1816, has actually had a better average return upon the most important of his products than he had before. It may be objected that this result is due to the Russian war of 1854, 1855, and 1856, and the failure of the French crops in 1861. So no doubt it is, but so long as human nature remains what it is, wars will occasionally prevail, while crops are constantly falling in one or another quarter of the world. Thus Hungary, which supplied France in 1861, had last year a very bad harvest, while France is now rejoicing in the prospect of plenty. The first four years of transition from protection to free trade formed, doubtless, a period of suffering; but since then, if figures go for anything, the British farmer has been able to hold his own, as not only have prices been better sustained, but production has been largely increased.

THE GROWTH OF ROOTS.

The usual monthly meeting of the Dorchester Farmers' Club was held in December. The subject for discussion was, "The Influences which Govern the Growth of Roots," which was introduced by Mr. Spooner, of Eling, near Southampton.

Mr. SPOONER, after a few prefatory remarks, said the subject he had selected as being appropriate to a farmers' club was one that must be acknowledged by all to be of great importance—"The Influences which Govern the Growth of Roots." In an assembly of English farmers it was quite unnecessary to detain them by making any observations on its importance, because they well knew that the growth of roots was that particular feature which not only distinguished the agriculture of this country from all others, but which also enabled it to stand pre-eminent. It was by the growth of roots that the population of this kingdom was supplied with an abundance of healthy animal food; for, they must well be aware that if the production of beef and mutton depended upon the grasses or the pastures of the country, it would fall very short indeed of the demand. And when they knew that the eastern counties alone supplied the London market with more beef and mutton than every part of England, Ireland, and Scotland besides; and when they knew that it was the practice in those eastern counties to feed their animals almost exclusively on roots grown with the aid of artificial food—no argument would be wanted stronger than this to prove the importance of the subject and its interesting character to agriculturists. The influences, then, which regulated the growth of roots were three or fourfold. They ought, perhaps, to consider the soil, the atmosphere, and those artificial means which were employed so successfully in this country to assist the one and the other. He should detain them but a few minutes on the subject of the soil, because the preparation of the soil for the growth of roots was a point more familiar to his audience than himself, and it was quite impossible for him to teach them anything they did not know relating to the physical improvement of the soil and its adaptation to the growth of roots. No great number of years ago (before the subject was so well understood as at present) it was considered essential that land should receive five ploughings at least; and there was a sort of superstitious adherence to this, farmers considering that they had no chance of a crop unless five ploughings were the minimum, instead of the maximum. But in the present day this had entirely disappeared, because they knew that if they could get the physical condition of the soil in a proper state—sufficiently pulverized to retain moisture and to receive the influence of the atmosphere, it did not matter whether they got it by two ploughings or one; for, so long as this was done, the result would be equal, or even still greater, because if by two ploughings, the land being sufficiently clean, they could reduce it to a sufficiently pulverised state, the amount of moisture accumulated through the winter would not be dissipated to such a degree as if the land was constantly turned over. There was no doubt one great cause of the failure in the turnip crops many years since was the custom then thought to be necessary of turning over the land with the cultivator and harrow so much through the summer months, and consequently dissipating its moisture. He would next devote a few minutes to the atmosphere. He had said that the soil must be in a state to admit of the extraction of that portion of food which was derived through the medium of the soil, as well as the moisture which acted as its vehicle. It was, however, very well known that, although they applied manure to the soil, and although the soil in itself contained a great deal of what might be called primitive fertility, yet, speaking of a crop of roots (swedes, for instance), the greater part of the solid matter was not derived from the soil, not from the manure, but from the atmosphere. Now, it was a fact that the growth of roots was more successful in this country than in any other part of the continent, and he might also say in any other part of the world, for, with the exception of

some of the rich land of Belgium, Holland, and Germany, throughout the greater part of the continent they scarcely knew what it was to grow roots. Although we had, as one of the most important plants, what was called the swede turnip, yet, in the country that had given the name to that root, it was comparatively unknown, compared to what it was in this country; therefore, although it might or might not have been originally derived from Sweden, it was, at any rate, in more temperate countries that the root had arrived at the great perfection to which it had attained. The atmosphere, then, was one of the most important influences which regulated the growth of roots; and in this country we were fortunately blessed with a climate which admirably suited this crop. We had a temperate climate, in which there was not that excessive heat which prevailed on the continent, nor that excessive amount of rain which fell in other places; neither were we visited in winter with that extreme cold which, in Russia and other places, prevented the crop being fed-off the soil, or anything like its preservation, unless taken up early in autumn. The rainfall in this country was also a matter of considerable importance. It was of importance we should have in winter sufficient rain not only to fill the springs, but to penetrate the subsoil, and so allow, through the warmth of summer, evaporation gently to take place, that the roots might be fed with a sufficient amount of moisture, and, at the same time, provide sufficient moisture to convey the food they put into the soil. In his county (Hants) the rainfall, during the last eleven years, had been a little above 24 inches—24.27. Up to within a few years past, the average was 26 inches. Two or three years afterwards it was reduced some 2 or 3 inches; but, during the last twelve months, or two years, it had been restored again. However, it was not only of importance that the amount of moisture should fall during the year, but it was also requisite it should fall with a tolerable degree of equality in the various months. Now, taking the average rainfall, there was no month that it averaged less than one inch; and they knew very well that if during the months of June and July they had less than an inch of rain, there was good reason to fear the root crop would become very short. There were some erroneous impressions prevalent with regard to what were considered the wettest and driest months of the year. It was interesting to know that the driest month of the year was February, and the next driest was March. The wettest month of the year was October—at any rate from the average of the last eleven years. A contrary opinion prevailed; but they could not upset figures; and, having kept a rain-gauge, he could assure them this was the fact. It was essential for a good root crop that we should have $1\frac{1}{2}$ or 2 inches during the months of June and July, and also a fair amount of rain during the autumn—it mattered not whether in the latter part of September or the beginning of October; but it was essential we should have a fair amount of rain, without a glut. This year, for the roots in Hampshire, they had too much rain in the beginning, followed by too little afterwards; and the two extremes had a bad effect. This was likewise the case in the eastern counties, and many of the midland counties as well. It did not seem to follow that in those districts where there was the greatest amount of rain they would necessarily have the best roots, because their growth was much more successful in the eastern and midland counties than in the western, where they had too much rain, which, however, was exceedingly beneficial to the grasses, that were always ready to imbibe and take up moisture; but the growth of roots required a moderate and gradual amount of rain, and too much moisture was not favourable to them: therefore it was that they raised better roots in the eastern counties, though they had far more dry weather. In those parts they might be more successful with mangel, which root, sown earlier, would take advantage of more moisture than the swede; but, taking the root crops altogether, they were generally more successful in the eastern counties, although the average rainfall was less than 20 inches, com-

pared with 26 inches in Hants. No doubt it was 28 or 30 inches here, for the further they got west, the greater was the amount of moisture which fell. While, then, extreme heat and extreme cold were alike unfavourable to the growth of roots, it was most important they should endeavour to preserve as much moisture in the soil as possible; and the finer the tillage the less amount of moisture would suffice. It was in consequence of the care they devoted to get a fine mechanical division of the soil in the eastern counties that they were able to do with a less amount of moisture than in other places. He said just now that the larger amount of the food of the turnip crop was derived from the atmosphere, and the smaller amount from the soil, but much of even that derived from the soil was rather from the atmosphere that existed in the soil than from the soil itself, the soil being rather the vehicle. If they took a turnip, or any vegetable substance, and burnt it, they found that the greater part was dissipated, and passed into the atmosphere—not lost, for nothing was lost in nature; and the smaller part that remained behind was only 1, 2, 3, or 5 per cent. of the original bulk. But this smaller part, although amounting to this small percentage, consisted of a greater number of materials than the larger part dissipated into the atmosphere. The earths that could not be burnt consisted of various elements, such as phosphate of lime, carbonate of lime, or phosphoric acid and lime, carbonic acid and lime, chlorine, magnesia, sulphuric acid and lime, and other elements not necessary to enumerate. The larger portion derived from the atmosphere was composed of four elements only; and these four elements had unfortunately been for a long time distinguished by such hard names that farmers might readily be excused for not retaining them in their memory—they were called oxygen, hydrogen, carbon or carbonic acid, and nitrogen. It was rather disagreeable to use these words, for, if the object of chemists had been to give definitions that could not be remembered, they could not have succeeded better. Now, the greater part of the turnip crop consisted of carbon, and this carbon was taken into the system of the plant by means of carbonic acid; and although carbonic acid was supplied in such an amount as to yield something like 14 or 15 tons an acre to the turnip crop in the course of the season, yet in the atmosphere it was considerably less than one per cent., or rather one or two in the thousand rather than one or two in the hundred. It varied very much under certain conditions. If people or animals were kept in a close building for some length of time the atmosphere, before perfectly pure, became deteriorated, which arose from giving-off carbonic acid during respiration. The oxygen in the atmosphere was taken into the lungs, where it combined with carbon, and, having done its duty, was given off as carbonic acid. It was carbonic acid which effervesced from soda water; and it was carbonic acid which accumulated at the bottom of wells, and often caused such fatal results to those who descended into such places. This gas was much heavier than the atmosphere, and might be poured from one vessel to another like water, thus it was that it accumulated in wells, and thus it was—he mentioned it as a most important provision of nature, and to show the necessity of having the soil properly pulverised—thus it was that the soil contained two or three times the percentage of carbonic acid as compared with that in the atmosphere, so that the air in the soil was considerably richer in the food for plants than the atmosphere itself. But they knew that when the leaves of the turnip were given out they acted as so many lungs; and it was by these leaves that the food was taken up—carbonic acid was taken up, the oxygen was returned to the atmosphere, while the carbon was assimilated in the system of the plant, becoming in fact its food. They supplied little or nothing of this carbon in artificial manures, because in the natural manures, such as dung, there was a considerable amount, so that it was not of sufficient value to make it worth while supplying it artificially. Hydrogen was a gas which was a principal element in water, and it was of importance that it should combine with oxygen to form this, for not only was it necessary for the turnip plant, which consisted of no less than 90 per cent. of water, but unless this 90 per cent. could be easily supplied, the other 10 per cent. of the constituent parts could not be obtained at all, for whatever manures they supplied it was only by means of water that they could enter into the system of the plant.

There was a controversy as to whether certain poisons could be taken up by the soil and then enter into the system of the plant, and a good deal of difference of opinion existed. It was thought that in sulphuric acid made from pyrites, which abounded in arsenic, certain gases were fixed and taken up by the acid; and thus soda-water manufacturers, who used a good deal, declined to purchase any sulphuric acid made from this material—they preferred that made from pure sulphur. It was by no means sufficiently established that poison could thus be taken up by plants; but at any rate there was no fear if the sulphuric acid was made from sulphur. He had said that carbonic acid, hydrogen and oxygen were taken freely into the system of plants—carbonic acid principally by means of the atmosphere. Now there was another gas called nitrogen which he would just allude to, because it was of importance as forming four-fifths or 80 per cent. of the atmosphere. The atmosphere consisted principally of two gases not chemically combined, oxygen being the smaller part, or about one-fifth, and nitrogen the larger part, or about four-fifths. The nitrogen diluted the oxygen, for if oxygen existed in a large proportion the world itself would burn up in a short time. Thus nitrogen was the most abundant, and, as it were, cheapest gas to be found in the atmosphere; and it had suggested itself to chemists, whose attention had been devoted to the subject, that, if this gas abounded so largely in the atmosphere, and if it was necessary that a large quantity should be supplied for the growth of roots and cereals, the atmosphere was the natural source from which to provide it. But all attempts to take this nitrogen from the atmosphere had entirely failed, and although it existed there in the greatest abundance, it defied man's power to bring it thus within his grasp. They were no doubt familiar with the word ammonia, and knew it consisted largely of nitrogen; 17 parts of ammonia contained 14 parts of nitrogen. Now this ammonia was in various forms. For instance, it was found in guano, and sulphate of ammonia, and in bones, and it was familiar to every one in smelling salts and hartshorn. Some twenty-five years ago, there was a very considerable degree of obscurity with regard to the different substances essential in manures, and there were a great many vague theories on the subject, most of which were founded on error. They had heard no doubt of the humus theory. It was thought that humus, or black earth, was the principle which supplied the plant with food; and it was long indeed before chemists could dismiss this from their minds; and it was thought that by a succession of cropping, this humus would be exhausted, and that different countries would in time become barren in consequence of the exhaustion of this substance. But when greater attention was given to the subject, when it was found that plants absorbed such a large amount from the atmosphere—that on barren soils trees were planted and shrubs grew where there was scarcely sufficient soil to attach them to the rock—that that which at first was only a few ounces next year became pounds, and in process of time even hundredweights and tons, which must have been derived from the atmosphere—the humus theory was quickly given up. This might be stated as one of the greatest discoveries of chemists at that time. But during this period very little was known about the earths of plants; and it was the custom of chemists in analysing a plant or grain to dismiss the question by simply saying there was so much per cent. of ash, thinking it as little importance what it consisted of. The next thing was to separate this ash into its different elements; and it was then found that these were of great importance, for although existing in the plant in the proportion of about one in a thousand, yet every one part was most essential to it. Within their own recollection a book had been written on agricultural chemistry by Professor Johnson, in which a chapter was devoted to the discussion of what elements in bones their value was to be attributed; and he rather held to the argument that the great part of the benefit derived from bones was due not to the earthy parts but to the nitrogenous or cartilaginous parts. But a very few years had added greatly to our knowledge on this matter. Nothing had been more satisfactory than the experiments which showed that when phosphate of lime had been applied in a mineral state it produced better crops than when no manure at all had been supplied. In another experiment the earthy part of bone and the cartilaginous part had been applied separately, and it was found that the benefit was infinitely greater. This at once settled the question. It was at the same time a most singular fact that when they looked at an analysis, say of a crop of

turnips, supposing they weighed 20 tons, they would be found to contain so much ash; and when they found that there was considerably less than 1 cwt. of phosphate of lime in the acre crop, or less than 3½ lbs. in a ton of roots, it might well excite the astonishment of chemists that it was this particular element which made the distinction in nine soils out of ten between a good crop and a bad one. It was not many years ago since other able chemists, who had directed their attention to this subject, used to speak of phosphate as being the peculiar manure for the grain crop, and ammoniacal manures as the peculiar manures for the green crop. They stated this because they found a ton of wheat contained a great deal more phosphate of lime than a ton of turnips, but they forgot that when they came to the acreage they could raise 20 tons of swedes where they could only raise one ton of wheat, which explained the difference immediately; for although there was a greater percentage of phosphate of lime in the dry matter of wheat than in the dry matter of roots, yet reckoning it by the acre the one had a considerably greater quantity than the other. It had, in fact, been proved over and over again that the peculiar and essential manure for the turnip crop was phosphate of lime. Now the reason why this was the case was partly explained by the fact that the custom in this country was to feed off the crop of roots on the land, in doing which the greater part of the phosphate of lime was taken away in the bones, and a portion in the flesh of the animals, while other essential ingredients, of which potash was the most abundant, was returned again to the soil by the manure that they left behind. It was a most important fact that the one was taken away in the shape of beef, mutton, and other products, whilst potash, soda, and various other elements were, for the most part, left behind in the manures. Then another important fact was that the great growth of the turnip crop was made in a very short period—indeed it was necessary that a great deal of the growth should take place in a very short time. Then there was another fact, which was of great importance, that the leaves of a crop of turnips or swedes contain double as great a percentage of phosphate of lime as the roots; and as the leaves were put out before the bulbs made any growth, it would be readily explained why this should be the peculiar pabulum to assist the leaves in their infant state, enabling them to expand and absorb the necessary and large amount of food derived from the atmosphere, and not only from the atmosphere but from the soil, because in proportion to the development of the leaves would the rootlets penetrate into the ground in search of the nourishment which might be artificially supplied, or which existed in the soil itself. It was something like twenty years since superphosphate was introduced, but before that bones in a crushed state had been applied with a great amount of success, because it was a new manure and the soil had been exhausted of the essential element which they contained. It had not been presented to the young plant in anything like the capability of the young plant to take it up, and therefore it was that bones were found in the first instance to have such a great effect. Then again the different acids found in the soil and the carbonic acid found in the atmosphere in the soil, had the power in time of dissolving the phosphate of lime in the bones, causing it to be more soluble and adaptable to the wants of the plant, though the process was necessarily slow. Then came the introduction of superphosphate, which was due to the suggestion of Liebig, although he was not the man to follow out the idea and take advantage of it, because he thought it was rather disadvantageous to make the manures too soluble, and therefore his aim was to render them less soluble instead of more soluble. It was remarkable he should have done this when he was the suggester of the manure. If phosphate of lime was the essential food of the root crop, it was apparent that if presented in a soluble form it would be more readily taken up; and the idea was at once acted upon by the chemists and manufacturers in this country, with what result the immense trade done in this particular commodity was the best possible answer. Now it was right that he should offer some explanation with regard to superphosphate, because even in the present day a great deal of error on the subject sprang up again and again. He held in his hand the rib bone of a sheep, which was in its ordinary shape, but had been submitted to a considerable amount of heat, by which all the cartilaginous parts had been burnt out. It was extremely fragile, and was in fact bone ash, which contained 80 or 90 per cent. of phosphate of lime united with carbonate of lime. Here was another bone which had been

submitted to the action of hydrochloric acid. A strong acid would have broken down the structure of the bone, but the weak acid penetrated the pores and deprived it of the earthy parts, leaving only the cartilaginous, when it might with ease be twisted round the finger. Now bones consisted mainly of the ash of bones, phosphate of lime—at any rate there was something like 50 per cent. of phosphate of lime, and perhaps 5 or 6 per cent. of carbonate of lime, which was similar to chalk or marble; and the other part one-third consisted of cartilaginous matter and some portion of moisture. The bone that they could easily roll round the finger was in a similar state to those of rickety children, which had not sufficient stability to support the weight of the body, because they were deficient in the earth of bones. It was the earth that not only built up the skeleton of the animal, but the skeleton of the plant likewise. It was right perhaps that he should show them the difference between sulphate of lime and carbonate of lime. Here was a piece of marble which consisted of carbonic acid and lime, or carbonate of lime, and on applying a little sulphuric acid to the surface they would see by the effervescence that chemical action was taking place, in consequence of the sulphuric acid being stronger than the carbonic acid, which before united with the lime, and having greater affinity to it. In the other hand he held a piece of gypsum, which consisted of sulphuric acid and lime, or sulphate of lime, and on applying sulphuric acid to this no action took place, because it was the same acid that was already in combination with the lime. Here again he had the earth of bones or phosphate of lime in combination with a portion of carbonate of lime. Now carbonate of lime was of no value, peculiarly speaking, in manures, because an abundance was supplied in the soil itself; yet if the soil contained no carbonate of lime whatever, then it would be of the same or even greater value than phosphate of lime. It was because the one was scarcer and taken up by animals to a greater extent than the other that the latter was of greater value. Still carbonate of lime was most essential to the bones of animals as well as phosphate of lime. If they had had to depend upon bones alone for their phosphates it must be acknowledged that the supply would have long since fallen infinitely short of the demand, and it would have been impossible to meet the wants of agriculturists. The whole world had, in fact, been raked for these phosphates. We obtained a large quantity of bone-ash from South America, where cattle were slaughtered for their tallow, and the bones being cheaper than coal were used as fuel, by which they were able to ship double the quantity in a cargo than if they were in their original state. Whether the trade was likely to continue he could not say, but there was no fear of their being deprived of this phosphate of lime, because in different parts of the world it had been found to exist in large rocks. Here was a piece of what was called apatite from Norway, where it existed to a limited extent; but would not pay for the expense of getting it, though a small quantity had been sent over for experiment, and had been found to contain from 80 to 90 per cent. of phosphate of lime. He also exhibited a piece of phosphorite from Estremadura, in Spain, where there was a large narrow rock remarkably rich in this material, which was likely to be brought by railway more within the reach of the commercial world. It contained 80 or 90 per cent. of phosphate of lime. The next specimen he exhibited was Sombroso phosphate, from the island of Sombroso, in the West Indies, which was for many years in the possession of this country, but was allowed to slip out of our hands as of no value at all. The captain of a vessel thought the island was composed of a curious substance, and he took a portion of the rock to America, where it was found to contain 70 to 80 per cent. of phosphate of lime, and the Yankees bought up his right for £1,000, and it would doubtless prove to be worth many thousands. It contained not only phosphate of lime, but magnesia and various substances so useful in manures. We also had phosphate in this country, in Cambridgeshire and Suffolk, which contained 55, 60, and even 65 per cent. of phosphate of lime; but the great drawback was that it contained a considerable quantity of carbonate of lime, which wasted a great deal of acid in order to get an equal amount of soluble phosphate. It was right that he should give an explanation of what was the meaning of soluble phosphate. They doubtless knew that nearly all elements united in different proportions to form different substances, and this was called by chemists the atomic weight. Now phosphate of lime consisted of three parts of lime, and one of phosphoric acid, and was therefore

called triseric acid. They did not know why this phosphate of lime, having three elements of lime and one of acid should be insoluble in one combination and soluble in another. It was enough to know that it was so, and if they wanted to make it soluble they must use the means to do so. Now by applying a certain quantity of sulphuric acid it united with two parts of the lime, leaving the other part combined with the phosphoric acid, which was then in a highly soluble state. Superphosphate thus contained a certain amount of sulphate of lime, which used to be supplied alone at a cheap rate, but its use is now generally diminishing, as enough is provided in the ordinary artificial manuring. It was also here explained that it was necessary to neutralise the carbonate of lime before they could act upon the phosphate of lime, and thus a considerable quantity of acid was, as it were, wasted in the formation of sulphate of lime. Mr. Spooner here made a little superphosphate from Cambridgeshire coprolite, which contained about 60 per cent. of phosphate of lime; and also showed how the soluble portion was taken up by water, and then made visible by the addition of a little soda or ammonia, which, by uniting with a good portion of the phosphoric acid, the remainder was left to unite with the same equivalents of lime as in bones or other matter. He wished to make this clear—that the phosphate of lime, after being rendered highly soluble, was easily fixed again, because it was the very process which took place in the field; for, although it was essential that it should be supplied in a soluble state, it was not in a soluble state that it was at first taken up, the different elements in the soil, such as lime or carbonate of lime, again rendering it insoluble. But they might ask, why should they go to this expense of rendering it soluble if it was to be made insoluble again? The reason was that, when applied in a soluble state, the rain came and dispersed it into the different parts of the soil in ten thousand smaller atoms; and, in addition, although chemically called insoluble, it was capable of being acted upon by the weaker acids, such as acetic acid, or carbonic acid; and a shower of rain would dissolve an infinitely greater portion, and render it fit for the food of plants than if supplied originally in an insoluble state. As he had said before, it had been shown, in a great many experiments, that the effect of supplying phosphate of lime was greatly to increase the turnip crop. Although ammoniacal manures were of great importance likewise, it had been found that, by the application of phosphate of lime, the produce had been increased ten or twelve times more than the natural state of the soil, while the application of ammoniacal manures only increased it by a few cwt. Mr. Laves had tried some experiments in the cultivation of land without applying manures, but his crop of roots dwindled down from eight tons to two tons, next year a few cwt., and the fourth year nothing at all, so that he was obliged to drop this part of his experiment; but he continued the experiment with wheat, and had obtained good crops on land not manured at all, and for a series of years. He was able, however, to continue the growth of turnips year after year by the application of superphosphate. These facts showed how essential phosphate of lime was to the turnip crop, and in the growth of roots. In conclusion, Mr. Spooner trusted that some gentlemen present would enlighten them on any practical facts connected with the subject which their experience would supply.]

Mr. DEVENISH observed that a friend of his, when sowing turnips, had exhausted the bone dust, and he then sent for a lot of pollard to finish with; but this was not enough, and he completed the piece with bran. The result was that the latter appeared to answer equally as well as the bone dust, and he asked how Mr. Spooner accounted for it.

Mr. SPOONER said the pollard and the bran contained a considerable quantity of phosphate of lime; and the vegetable part of the corn, being partly converted into carbonic acid, assisted in dissolving it. The phosphate of lime existed mostly on the inside of the bran; and, while wheat contained nearly 3 per cent. of ash, nearly one-half of this consisted of phosphate of lime. This would go far to explain the effect Mr. Devenish had alluded to.

Mr. CLEMENTS said he had applied bone manure to different soils, but he had found they had the greatest effect on a sandy soil with a calcareous subsoil. On stiff clay land it had little or no effect.

Mr. SPOONER said there was no great difficulty in explaining this. It was found that superphosphate had the greatest effect on those soils that most quickly rendered it into an insoluble state again; and the calcareous matter derived from

the subsoil had the power of doing this. The soluble phosphate must be fixed in the soil, otherwise it would act like a poison to the plant.

Mr. CLEMENTS also asked what would be the best artificial manure for the turnip crop in this county on a chalky subsoil?

Mr. SPOONER replied that they must have plenty of phosphate of lime in some form or other, and a certain quantity in a soluble state. Perhaps the greatest effect would be produced by a combination of superphosphate, bone dust, and a little guano.

Mr. S. HARDING asked why it was that in the neighbourhood of Sherborne superphosphate was found of little use?

Mr. SPOONER explained that where the green sand cropped out on the borders of the chalk formation, the soil was rich in phosphate of lime, and therefore it was not necessary to apply it artificially.

Mr. T. H. SAUNDERS asked what effect guano would have on such soils?

Mr. SPOONER said it would do a very great deal better, as it would supply other ingredients in which perhaps the soil was deficient, particularly ammonia.

Mr. R. DAMEN observed that that was why nearly all his customers in that locality used guano.

Mr. SPOONER said guano contained about 30 per cent. of phosphate of lime, about 5 per cent. of which was soluble. On a soil where phosphate of lime acted favourably it would be foolish to go to the expense of supplying it in guano, because it could be done much cheaper otherwise. Guano was better for mangel, because they did not contain one-half the percentage of phosphate of lime as was contained in the turnip crop. Mangel, however, contained a large proportion of salt, which it was necessary should be supplied.

Mr. T. H. SAUNDERS said he had not found any good from using salt, which he attributed to being so near the sea, that the atmosphere supplied what was necessary; but guano he had found very beneficial. He also gave instances where salt had had an injurious effect on healthy land that had been chalked.

The CHAIRMAN asked how it was that pig manure would beat any that the manufacturers could sell? Give him plenty of pig manure, for, with this, he had never sown turnips without having a good crop.

Mr. SPOONER said an explanation was scarcely necessary, as Mr. Harding had made use of the magic word "plenty." He then explained that, in consequence of the pig being fed on such rich food, and making so great a proportion of fat, in which there was no nitrogen, a great proportion of the phosphate of lime was left in the manure. The true explanation was, however, in the word "plenty."

Mr. SAUNDERS observed that, according to what Mr. Spooner had said, and the fact alluded to by Mr. Devenish, they had better feed their pigs more on bran, for the purpose of getting manure.

Mr. SPOONER said they must get rid of their sprouted barley first.

Mr. HOMER thought Mr. Spooner was quite right when he stated that, if they got a luxuriant plant in its early stage, it derived more from the atmosphere. There was one point which struck him—whether they got more from the atmosphere on good land than on poor land, seeing that they required double the quantity of manure on the latter to produce anything like the same weight of roots.

Mr. SAUNDERS observed that on good land they did not want half the manure to drive the plant into leaf so as to derive benefit from the atmosphere.

The CHAIRMAN considered that they pulled about their poor lands too much, and, as Mr. Spooner said, dissipated the moisture. That was one reason why they did not get such a good plant on their poor lands as on the better lands, which were pulled about less.

Mr. G. GALPIN believed that the secret of the good effected by superphosphate lay in the forcing of the plant in its early stages—in the first place, out of the way of the fly, and then producing a large development of leaf, by which the plant was enabled to receive its food from the atmosphere. Then, with regard to the difference which different soils had upon the quality of the turnip crop, he thought he might say, without anticipating Mr. Spooner's reply, that the plant, although receiving the greatest portion of its food from the atmosphere, yet required the soil to furnish those materials which would

assimilate or combine with those supplied by the atmosphere, in order to form a perfect plant. There was one observation he should like to make with regard to superphosphate. They were led to believe a great deal of this manure was made from bones. Now in the present state of things they might expect the supply of bones to be exhausted, or at least they were becoming so expensive that they could hardly expect the bulk of superphosphate would be made from this material. Now chemists, he believed, were not able to determine by analysis the difference between insoluble phosphate made from bones and that made from coprolite. Now supposing two superphosphates containing the same quantity of soluble phosphate, the insoluble in the one made from bones, and that in the other made from coprolite or any other mineral, the former would be much more valuable, because the bone phosphate would become soluble in a much shorter time than the other. Now they had to depend entirely upon the manure makers as to whether superphosphate was made from bones or from coprolite. After alluding to the opinion of Professor Voelcker on this point, he expressed an opinion, however, that he went too far in saying that it was impossible for chemists to give a decisive value to manures. The aid they had received from chemists was scarcely appreciated, but the fault had been in giving a certain fixed value to different ingredients without considering their market price, or that which would apply in one year would not apply in another.

Mr. SPOONER, in replying, said the difference in the value of coprolite and bone ash was not so much owing to the phosphate as to the large quantity of carbonate of lime which the one contained as compared with the other. If to neutralise this the one wasted ten parts of acid while the other only wasted two parts, the latter would be the most valuable; that was as far as the soluble phosphate they afforded. As to what Mr. Galpin had stated, they knew that of late years there had been a great improvement in the manufacture of super-

phosphate, and whereas some years ago there was a larger proportion of insoluble phosphate, now the greater portion was rendered soluble—20 to 25 per cent. of soluble, and perhaps not above 10 or 12 per cent. of insoluble. Now there would be no difficulty in rendering the whole soluble, but they would have to apply a greater quantity of sulphuric acid, which would cause the manure to be moist, and if they used a drying substance, it would again reduce its commercial value. Now with regard to whether insoluble phosphate from coprolite was of as much value as from bones, he said certainly not; but there was not the slightest difference in the soluble phosphate. He did not, however, go so far as Professor Voelcker, who implied that it was of extremely little value; because in many cases phosphate of lime ground up in this very state had been found to produce a very good effect. Mr. Galpin observed that it was impossible for chemists to say whether insoluble phosphate was made from bones or minerals, but Professor Voelcker himself mentioned in various analyses that the insoluble phosphate was more valuable because it was derived chiefly from bones. He at once acknowledged that whilst a good portion of the soluble phosphate was derived from other materials, the best portion of the insoluble was made from bones in order to make it more valuable; and chemists could make a very good estimation from the products in the analysis whether the insoluble was from mineral or bones. As to Mr. Homer's question, the word "good land" was very indefinite because it might arise from the mechanical condition of the soil or the manuring properties in it; but he did not know that this would cause any difference in the amount of food derived from the atmosphere, excepting that in proportion as the leaves were developed so would the plant imbibe more nourishment from this source. After a few other observations, Mr. Spooner concluded by thanking them for the attention which they had listened to what he had brought before them on this important subject.

PRACTICAL METEOROLOGY.

A growing taste is manifestly being excited in this country for the study of practical meteorology, and it is to be hoped that, when the materials which have been and shall be accumulated, have been reduced and published, important results to agriculture as well as to other arts may be hence deduced.

For ourselves, we have long devoted space to discussions and correspondence on this subject, and the contributors to our columns were among the originators and active supporters of the Meteorological Society of Great Britain more than thirty years ago. Among the members of that society were ranged the names of Messrs. J. B. Denton, W. H. White, P. L. Simmonds, and others. A kindred Society has since been started in the north, and we are glad to see that the Scottish Meteorological Society is actively at work, and that the Marquis of Tweeddale has offered a premium of twenty guineas for the best scientific explanation of those popular weather prognostics of Scotland, which have recently been collected and published by Dr. Mitchell, a member of the council of that society. The noble Marquis thinks that these natural observations ought to attract a much greater amount of attention than they have yet received. "While," he observes, "I am far from regarding proverbs and popular sayings in general as constituting codes of natural wisdom, I am at the same time disposed to think physicians have been wrong in treating with contempt those sayings or proverbs which refer to natural phenomena. It would, no doubt, be a great mistake to receive them blindly, but it is no less so to reject them without examination. Guided by those principles, I have sometimes found important truths where others had seen merely groundless and obstinate prejudices." And then he cites in illustration the fact that certain shepherds, without scientific apparatus, and simply

by watching the aspect of the sky and the atmosphere, had been able to foretell the extraordinary snow-storm of 1861 in sufficient time to save themselves and their flocks from its disastrous effects. No classes of men are so much interested in this kind of knowledge as farmers, sailors, and shepherds, and none have more ample means of observation. Weather prognostics which guide their movements are not to be laughed at because trusted in by those making no pretensions to science. These popular prognostications of the weather, whether true or false, are important: as Dr. Mitchell truly observes, "Faith in such signs determines in no small degree the actions of shepherds, farmers, seamen, and others, by whom they are trusted in such a manner, as to lead either to gain or loss. It is this consideration which gives to the study of them a practical value. They either mislead and cause loss of time and property, or they are useful and ready guides to be consulted and obeyed with profit. Their actual influence on conduct for good or evil makes it clearly desirable that their trustworthiness should be carefully tested." It can hardly be doubted that there are natural indications which, when long and accurately observed, give certain premonition of approaching atmospheric changes. Natural observations and scientific indications may judiciously be combined, and even the gallant Admiral, who sends forth his forecasts of the weather officially for the guidance of mariners, does not neglect the former.

In order fully to establish a proper theory of the weather it would be necessary to have registers carefully kept in divers parts of the globe for a long series of years, whence we might be enabled to determine the average periodical fall of rain, the mean temperature, the directions, breadth, and bounds of the winds and the weather they bring with

them, with the correspondence between the weather of distant places and the difference between one sort and another at the same place. From such documentary evidence we might in time learn to foretell many great emergencies, as extraordinary periods of heat, long continued rains, severe droughts, epidemic diseases, &c. Nothing of this kind, at least to any extent, has yet been done, as regards our distant possessions, and much time must elapse before such returns can be obtained.

For the science of meteorology to attain that rank which its importance demands, it is necessary that extended systems of co-operation should be established. In regard to climate no part of the world is isolated; that of the smallest island in the Pacific is governed by the general currents of the air and the waters of the ocean. To fully understand, therefore, the causes which influence the climate of any one country or any one place, it will be necessary to study the conditions as to heat, moisture, and the movements of the air, of all others. It is evident also, that as far as possible, one method should be adopted, and that instruments affording the same indications, under the same conditions, should be employed.

There is no subject of more generally popular interest than that of the changes of the weather, and the relative temperature and humidity of the district we inhabit. And when we consider that climatic influences enter even into the constitution of national habits and peculiarities, determining as they do in part the pursuits and temperament of an entire people, and when we reflect how much of our personal comfort and convenience depends on the climate in which we live, and how sensibly our feelings, and even our mental operations, are influenced by the pressure, temperature, and electricity of the air, it becomes apparent that any researches which may tend to throw light on the laws which regulate the variations of these elements must be viewed with interest and approbation by all who are capable of appreciating the value of scientific certainty with respect to those atmospheric changes by which we are so constantly and intimately affected. But meteorological observations are not alone interesting from a purely scientific point of view. The facts which they reveal are directly applicable to the wants of the husbandman; they aid in enabling him to predict, without a ruinous series of trials, what plants he may safely cultivate, or what animals he may succeed in rearing. The amount of heat and moisture in given places being known, together with their comparative distribution through the several seasons, the farmer can determine whether, in the course of a number of years, he will be a gainer or loser by introducing the culture of a plant new to his locality.

No improvement is more necessary for rendering the art of agriculture precise than the introduction into its

processes of the two essential principles of science, namely, those of weight and measure. All the processes in our manufactures on a great scale, which were formerly conducted by mere guesses as to heat and quantities, are now subjected to rules, in which the measure of temperature and the weight of materials are definitely ascertained by valuable instruments.

The practical value of meteorological statistics is not, however, confined to the farmer, but is shared by the engineer and the physician. The former employs them in his estimate of the supply of water which can be obtained for the purposes of locomotion or mechanical power, and the latter in the study and amelioration or cure of diseases. To the mariner a knowledge of the currents and winds of the ocean is of the greatest importance, but these can never be fully understood or their changes predicted without a series of contemporaneous observations, on the land as well as on the sea.

The almanac-mongers of old times, as even in the present day, were great weather prophets; and one "antient learned Leopoldus Austricus," who wrote many centuries ago "on the state and condition of every year for the commodity of the wise husbandman," gives us the following information, though on what data founded is of course unknown:—"If the first day of Januarie happen on Fridaye, then shall the winter be very cold and dry, the springe boysterous and wette, the harvest more wette than drye, and young children shall then dye. Also plenty of frutes is then promised, though much haile fall that year." Whether all this will be fulfilled in 1864 remains to be seen.

So suddenly did the late severe frost set in after the close autumn, and so rapid have been the changes of temperature, that sickness and death are likely to make grievous havoc, especially among the old and the young of the poorer classes.

There is a great connection existing between fog and snow, and the former, on being suddenly congealed before its small particles become condensed, causes a fall of the latter; and when a thaw comes on, if no wind occurs, we may see the snow dissolving in steam or fog, or its pristine state is again maintained. In a general thaw, if there be no wind, fog always comes on, as both snow and frost when dissolved become fog; and again, reciprocally, fog on congeallation produces hoar frosts and snow. Thus it is evident that a great connection really exists between fog and snow, and a somewhat less connection between fog and frost. A continuance of fog in December, observes Mr. Whittlecraft, in his "Climate of England," usually precedes a severe winter of snow and frost, and as regularly do we notice a prevalence of fogs after a thaw, or during the dissolution, if no wind blows.

SIR JOHN HERSCHEL ON THE WEATHER AND WEATHER-PROPHETS.

A very admirable paper appears in the current number of that excellent publication "Good Words," on the subject of the weather, from the pen of Sir John Herschel. On this paper we propose to offer a few remarks to our readers—first, because they emanate from one of our foremost men in the ranks of science; and secondly, because the views expressed by the learned meteorologist are so much in accordance with those we have frequently given utterance to (*ex cathedra*) in our pages.

It is very significant of the universal interest that such topics possess when we find a monthly magazine, of large general circulation, giving up sixteen of its columns to a really scientific discussion of the phenomena of the weather,

and this, too, in a manner by no means superficial. Admiral Fitzroy's forecasts have almost become a popular institution, and those who at first were inclined to ridicule the meteorological department as one of the most unnecessary of the Board of Trade, have generally acknowledged, by the interest taken in the daily reports, and the respect paid to the warnings of the "cones and drums" by the sea-faring population, that it is not only one of the most scientific, but also one of the most practically useful of our Government offices—an assertion that now needs not to be upheld by argument, for every watering-place in the country has some interesting tale of its own to tell how fishing expeditions and pleasure parties on the water

have been postponed on account of the storm-signals being hoisted; and how shortly the storm has come, during which, but for these same signals, they would probably all have found the gift of a grave.

This department of meteorology (that of predicting the weather) is undoubtedly still in its infancy, and therefore destined to see a yet stronger, bigger development—that is, if carefully tended and reared; and there is every reason to hope that the subject will receive the careful attention that it deserves; for the good example set by our Government in fostering the science has already spread itself over Holland, and is also feeling its way over the large territory of our Gallic neighbours. Whatever more will be done towards perfecting the system, it is certain that it must be in the same direction in which we have begun—a basis, founded upon observation, elaborated and discussed by our leading meteorologists. No step can be safely taken for which we have not the stamp of nature, no consequence assumed for which we have not the warrant of, at least, scientific probability; but in our present state of progress, our knowledge of causes enables us, as far as we go, to lay down predictions, answering for a very short period in advance, with very great accuracy, if not with certainty. But let us quote a few lines from Sir J. Herschel himself on this point (we have ourselves frequently in substance made the same remarks regarding weather prognostics): “It is to be borne in mind, however, most carefully, that all such indications are to be received as valid (*pro tanto*) only for a very brief interval in advance; and that the ‘weather-prophet’ who ventures his predictions on the great scale is altogether to be distrusted. A lucky hit may be made; nay, some rude approach to the perception of ‘a cycle of seasons’ may possibly be attainable. But no person in his senses would alter his plans of conduct six months in advance in the most trifling particular, on the faith of any special prediction of a warm or a cold, a wet or a dry, a calm or a stormy summer or winter.”

There are (for though their number is now much smaller than they were, they yet hold some ground) some pernicious publications, usually issuing from very obscure localities, that find their way amongst our rural friends, which we would gladly see disappear entirely. We allude to the weather-tables in almanacs sold to farmers; one of which used to be ascribed to Sir W. Herschel; that it was falsely so ascribed we needed not to be informed in the paper before us.

The miserable theories, if theories they had, that directed the concoction of these remarkable tables, varied as much as the predictions themselves, and they were as

numerous as the almanacs. The favourite topic in such, however, was the moon. There is a class of lunar prognostics, though that must not be confounded with some other systems that we shall presently mention; the appearance of halos, coronæ, lunar rainbows, and what is denominated a “watery moon,” are all indicative of wet weather, since they denote the presence of vapour passing into the form of clouds in the higher regions of the atmosphere.

But the most absurd influences were attributed to our satellite, founded upon the hour of the day or night at which her changes take place. To describe the various plans adopted by the different lunar weather prophets were to undertake a task as uninviting as it would be tedious; let it therefore be enough to say that they were much alike in their arbitrary character, precisely similar in their utter worthlessness. After disposing of the weather prophets, the author goes on to give his readers a thorough insight into the phenomena of the weather; he takes us up, as it were, above our atmosphere, and lets us look down upon the troubled ærial waves, making us see at a glance the leading processes of meteoric action. Into this field we shall not attempt to follow the learned author, more especially as we have in former numbers delivered ourselves much to the same purpose. We cannot, however, refrain from giving our readers one more extract from this admirable paper, and with it take leave of the subject for the present.

“The causes by which that ‘various and mutable thing’ which we call THE WEATHER are produced are in themselves few and simple enough; but the physical laws which determine their action are numerous and complex, and the results in consequence so mutually interwoven, and the momentary conditions of their action so dependent upon the state of things induced by their previous agency, that it is no wonder that it should be next to impossible to trace each specific cause (acting as it has done through all past time) direct to its present effect. Yet from this very complexity results that sort of regulated causality—that apparently accidental yet limited departure and excursion on either side from a monotonous medium—that exceeding variety of climate, which renders our globe a fit habitation for such innumerable diversities of incompatible life—and that general equilibrium in each, which secures to every species, and to each individual of them all, its due share in the distribution of heat, moisture, and wholesome air; considerations, these, which are not lost on those who believe that they can trace in nature the operation of motive and design as distinct from a mere necessity arising out of the nature of things and the conservation of *vis viva*.”

THE PRESENCE OF PHOSPHORIC MATTERS IN THE ATMOSPHERE.

[TRANSLATED FROM THE “JOURNAL D’AGRICULTURE PRATIQUE.”]

In making the analytical researches upon rain water, which I had the honour of presenting to the Academy in 1853 and 1858, I discovered in the dry residue accruing from the evaporation of those waters palpable quantities of phosphate of lime; but I thought I ought to preserve silence on that subject, because I noticed that water chemically pure, having been boiled, or left to stand and settle some time in glass or porcelain vessels, always contain phosphate. However, the existence of phosphoric matters in the atmosphere appears to me extremely probable, and that existence, if it be true, having first for its effect the dissolving of phosphoric matters by meteoric waters, I shall apply myself to remove all the causes of error which it is possible to suppose, in order to put in evidence a fact which [must play an important part in the

terrestrial constitution] and chemical status of the organized beings spread over the surface of the earth, and in the aerial beds which surround it everywhere. In order to resolve the problem which I proposed to myself, it was only necessary for me to obtain some rain-gauges and platina vessels, to collect the water which fell at Paris or in the country; I pledged myself only to use in my experiments water which fell in my presence upon surfaces previously well cleaned. The evaporations which took place from large quantities of water, in consequence of the small proportion of phosphorus existing in each litre of liquid, and because I had made it a rule not to refer to reactions, but to separate the phosphorus under a form which would enable me to prove all its properties, were made exclusively in closed vessels made of platina.

In order to remove every doubt, and place a new fact apart from every objection, I put for evaporation 1,395 litres of water collected at Paris, and 390 litres of water collected in the country during five successive years. The total weight of the dry residue from the Paris water was 29,264 milligrammes, and from the country 3,073 milligrammes. These two results corresponding to 22.8 milligrammes and 7.8 milligrammes per litre of water. If we regard all matters which are found in rain water as the result of atmospheric impurities, the two preceding numbers should be taken as the approximate doses of the comparative purity of air in such a country as Brunoy, and that of a large city like Paris. There is nearly three times as much of diverse matter, though imperceptible and invisible, suspended in Paris air, as in that of the neighbouring countries.

After several experiments I found that the most certain, easy, and rapid process of recognising and measuring very minute proportions of phosphoric acid in a matter which in itself possesses very little of it, and which contains no appreciable proportion of iron, is that which M. Chanel put before the notice of the Academy at the commencement of the year, and which consists in obtaining phosphate of bismuth in liquids rendered sufficiently acid by nitric acid. But I do not think it would be prudent in researches of this nature, where we ought to estimate some fractions of a milligramme, to decide upon appearances even entirely characteristic of the substance we dose. For this reason I have always been careful to re-collect the different precipitates of phosphate of bismuth which I obtained in the same series of experiments, that I might be able to extract from it the phosphoric acid under the form of ammoniacal-magnesian phosphate well crystallized, and ascertain whether the weight of the latter component corresponded to the quantity of the citorial partial doses. When once we possess ourselves of the ammoniacal-magnesian phosphate, it is possible to submit it to every experiment of nature to prove that we have extracted the phosphoric acid from the substance analysed.

The proportion of phosphoric acid dosed in the different residues by evaporation of rain-water varied from 2 to 11 per 1,000. That only corresponds to a quantity of phosphoric acid, varying from 0.05 to 0.09 per litre from rain-water. The quantity of phosphoric acid contained in the residue of evaporation from the country waters is much greater for the same weight than in the residue left by rain-water in Paris. This proves that certain saline matters predominate in towns, and that their presence diminishes the relative proportion of phosphoric matters. In short, no sensible difference has been found in the average dose of phosphoric acid contained in Paris water and that of the country.

We see, from the preceding results, that the annual addition of phosphoric acid which can be made to arable soil by rain-water amounts to about 400 grammes per hectare. The researches of M. Boussingault have discovered that a hectolitre of wheat carries from the soil nearly 1 kilogramme of phosphoric acid. We see, then, that in order to obtain in wheat 7 to 8 hectolitres per hectare—that is to say, the ordinary crop of lands cultivated with manure upon the fallow system—it is necessary to let the fields rest nearly twenty years, if the soil contains no trace of phosphates, and if there has been no addition of phosphoric matters from other causes, such as rain-water.

But it occasionally happens that there, where chemical analysis is still unable to discover phosphorus, wheat nevertheless multiplies itself; for this reason—vegetation is often the best means of analyzing arable soil, because the roots of plants have the power of drawing from the earth elements necessary for the constitution of the vegetable, for these elements concentrate themselves in certain bodies, as, for example, the phosphate of lime in the grains. Nevertheless, certain soils are unsuited to the culture of cereals; and people who, like the Arabs, do not know how to manure their lands, are obliged, after having taken a few meagre crops, to abandon them for several years, until the sterile fields regain the elements necessary for a fresh harvest. I am prepared to show that the atmosphere can restore to the soil phosphates, just as the researches of modern chemists have proved that it can restore azote. But if a man be not able by his genius or labours directly to enrich the soil which he cultivates, that soil, abandoned to natural agents, will only furnish to plants the elements strictly necessary for a tardy multiplication, and

there would only be, as M. Boussingault remarked, "a limited vegetation."

I represented in my researches, by means of phosphoric acid, that I discovered the existence of phosphorus in rain water. Far be it from me to assert that phosphorus necessarily exists under that form in the atmosphere. No doubt, as M. Elie de Beaumont has shown, phosphates are distributed over a great number of rocks, as it is evident that amongst the dust raised by the wind from the solid crust of the globe some phosphate of lime ought to be found which the agitated atmosphere disseminated over all the surface of the earth. Thus, in treating the solid residue left by the evaporation of rain-water by the washing process, for making immediate analysis of it according to the principles laid down by M. Chevreul, I succeeded in separating some phosphate of lime. But, moreover, in the organic matters of rain water—matters that Zimmerman, Brandes, Hermbstadt, and Kruger have noticed at different times—M. Boussingault has equally recognised, and upon which I have already made a communication to the Academy. We have succeeded in proving the presence of phosphorus when we separated them from all the salts which contaminated them.

The winds, said M. Humboldt, in his "Tableaux de la Nature," raise from the surface of the drained waters some Rotifères Brachians and a multitude of invisible animals, immovable, and presenting all the appearance of death, these beings float suspended in the air until a shower brings them to the earth. The atmosphere contains, besides, innumerable germs of future life, such as the eggs of insects and seeds of plants." For a long time, agriculturists have attributed the cryptogamia which are too often found upon corn, potatoes, the vine, &c., to the germs brought by the atmosphere.

M. Pasteur has lately discovered that the organic powders suspended in the air are unequally disseminated, and that, on the other hand, they are the first and necessary condition of life in the infusoria in putrefactive bodies and in all liquids capable of fermenting, when these liquids and matters do not themselves contain the germs. Now, wherever the physiologist has seen life transmit itself, the chemist has proved to this day azote and phosphoric matters. Is it not natural then, when organised beings are contained in the dust of the air, or, as we see, that the impurities of the atmosphere, according to the expression of Bergman, contains the same matters. I have already mentioned azote there. In proving now the presence of phosphorus, I merely put in evidence the grand generality of the laws which preside over the reproduction of beings. Permit me just to say that it is worthy of notice, we find the same substances in the germs of all the beings which appear to us infinitely small or very gigantic.

The presence of phosphoric matters in the atmosphere, and afterwards in rain-water, might be attributed again to another cause, upon which I shall say only a few words. It is not impossible that the putrefaction of animal matter in the bosom of the earth, and particularly in marshy lands, give birth to phosphoretted hydrogen, which disengaged itself along with the carbonated hydrogen already proved in the atmosphere by M. Boussingault. Several chemists have not even hesitated to attribute the ignis fatuus which have at all times excited the attention of men, but upon which there has never yet been published any scientific works, to the disengaging of phosphoretted hydrogen spontaneously combustible, which exhales from all cemeteries and lands covered with the debris of animals. It is evident that the atmospheric phosphoretted hydrogen could be regained from rain-water in a state of phosphate.

Whatever may be the cause of the presence of phosphoric matters in the atmosphere, if we consider that, according to the researches of MM. Bineau and Pasteur, the cryptogamic vegetations consume from ammonia nitrates and phosphates, we find very remarkably that the infinitely small but innumerable beings which exist in the air carry with them when they fall to the earth all the elements necessary to their development and reproduction. The mind is equally struck by seeing that the atmosphere contains all that science recognizes as necessary for rendering fertile, in the end, the most sterile soil. In short, it is to the interest of the public health that rain waters contain, besides air, and carbonic acid, all the salts which render water salubrious and agreeable to drink.

J. A. BARRAL,

SUBSTITUTE FOR STARCH.

Perhaps there is no substance which is more called for, in the present day, than some non-edible material, as cheap as any at present in use, and obtainable in large quantities. The uses of starch are every day becoming more and more extended, not only for domestic purposes in the laundry and for food, but in the increasing manufacturing operations of our own and other countries. The extent of the manufacture and the amount of the product consumed it is impossible to estimate, although there are some data available, which show its great and increasing amount. The drain upon food products for this manufacture is not so much felt during the time of plentiful harvests, but there are occasions when the subject presses strongly upon the notice of many. The Society of Arts has long directed public attention to this matter by the offer of premiums. In 1849 the Society of Encouragement of Paris offered a prize of 10,000 francs (£400) for the introduction and cultivation in France of farinaceous alimentary roots not cultivated in Europe, and capable from the quantity and nature of their product of coming in partially as a substitute for the potato. This offer, however, led to no practical result. In 1855, the Belgian Government offered a similar premium for the discovery of a non-alimentary substance fitted to supply the place of the ordinary starches in their industrial uses, and large starch manufacturers themselves have given much attention to the subject, but as yet without any very satisfactory result. It may, however, be worth while to notice what has already been done in this direction, for the information of future investigators. We will first however make a few observations on the peculiar properties of *fecula* or starch.

It is the special composition of starch, and the exceptional character of its nature, forming as it does one of the most valuable products of the organic kingdom, which permits its adaptation to practical uses, its modification into various forms, and its metamorphosis into so many varied products. There is, in fact, no other substance, out of the class of *feculas* and their congeners, which is capable of assuming divers such transformations as starch. Under the magic wand of science, it is converted into paste, dextrine or gum, sugar, alcohol, and different acids. Again, it is formed into a viscous or gelatinous matter, capable of assuming all degrees of consistence. Furthermore, it gives to tissues, to which it is applied, body and resistance, as well as whiteness and lustre. No other material possesses, on its application, in the same degree as starch, the property of giving to stuffs a degree of elasticity, and suppleness, and the property of being washed out in water. No other substance presents, at the same time, the great advantage of a perfect neutrality, which permits the association of a number of other agents, preserving its own properties without altering theirs. Starch is the essential nutritive principle of plants. The French chemist Parmentier, in his work on the means of preventing famine and dearth, publishes two long lists of wild plants, the seeds or roots of which contain *fecula* which might be utilized, in the place of that obtained from corn, for industrial uses. A great part of the starch now used in commerce is obtained from the potato. Starch from rice and maize, and on the Continent the horse-chestnut, has of late years contributed something to the enormous demand for this substance. But independently of these, and of the starch made from low quality and damaged grain, foreign commerce supplies us with many exotic *feculas*, which on account of

their high price and superior quality are principally reserved for dietetic use. Besides its use for food, a solution of flour or starch is largely employed as paste. Enormous quantities are consumed in this form in the manufacture of paste-board, card-board, and papier-mâché, in the process of binding books, in enveloping newspapers and periodicals, &c., for transmission by post, in papering rooms, affixing placards and posters to walls, in applying colours, and in stiffening or dressing textile fabrics, to which it gives a lustre and a certain degree of closeness. The weaver also uses it extensively for giving a facing or surface to his work. The stiffening or starching of wearing apparel consumes an equally large quantity, and the sizing of paper—an operation which was formerly exclusively done by gelatine—also uses up much. The surgeon has brought it into new uses, either in the form of dextrine or starch; as for instance, to give adhesion to the bandages applied to fractured limbs. Starch is also employed for hair-powder, and the skin-powder used by ladies and in the nursery; while the art of the confectioner brings it into daily use for making common sugar-plums, many jellies, &c. Of late years one of the largest uses is in the chemical arts, where starch serves for the manufacture of oxalic acid, glucose, and artificial syrups, and it is also converted into alcohol, wine, beer, vinegar, &c. It is from the consideration of these various uses of starch for industrial purposes that we come to appreciate the importance of fit substitutes, and the benefits that would accrue therefrom.

Since 1845, the manufacture of dextrine or torrefied starch has attained, in Germany, in England, and in France, an enormous development. It now takes the place of gum-arabic and other mucilaginous gums, for most purposes. While, however, Europe has been thus greatly relieved of the expense formerly incurred for a precarious supply of African gums, she has been at the same time drained of much of her available food-supply from grains and roots. In 1795, the Society of Arts endeavoured to lessen the consumption of grain for starch-making, by offering a reward for starch made from the horse-chestnut, a fruit considered of very little, if any use; and in subsequent years a gold medal and 80 guineas were offered for not less than 2 cwt. of starch made from materials not used as food for man. This led to the manufacture of what is termed Portland arrowroot, made from the roots of the *Arum maculatum*—a plant not previously generally applied to that purpose, but which is known to grow spontaneously in almost every part of the kingdom. There is no doubt, observes Parmentier, that the workmen who consume such large quantities of excellent flour in the preparation of starch and paste might with advantage use instead the *fecula* contained in many bitter and acrid roots. These, cut into slices and dried in an oven or stove, and crushed in a mill, would furnish a powder well suited for their purpose, and less liable to alteration. Horse-chestnuts and acorns might be thus used, as they are always at hand. The trees which bear these fruits are in the one instance very useful, and in the other good for nothing. Out of 136 essays sent in, in competition for the premium offered by the Belgian Government in 1856, 27 treated of the applications of the horse-chestnut, several recommended a solution of Carageen or Irish moss and other sea-weeds, nine proposed the use of animal gelatine, eight enlarged upon the virtue of the *fecula* of the bryony root, and some entered into the merits of the mucilage obtained from lin-

seed and the African ground-nut. The millets and sorghums, and other small-seeded cereals, were vaunted by others. The peelings of potatoes, the residue of distilleries and of paper-mills, and the mulchage furnished by certain barks, were sought to be utilized by others. Some of the

suggestions are curious only, whilst others have a show of probability about them sufficient to deserve notice on a future occasion, although none were deemed of sufficient importance to warrant the award of the premium at the hands of the commission delegated to examine their merits.

REVIEW.

THE COMPLETE GRAZIER AND FARMERS' AND CATTLE BREEDERS' ASSISTANT: A COMPEMDIUM OF HUSBANDRY, &c., &c.

BY WILLIAM YOUATT, ESQ., V.S. ELEVENTH EDITION, ENLARGED, &c.; BY R. S. BURN.

London: Lockwood and Co., Stationers' Hall Court, 1864.

The name of William Youatt has long been a "household word" with the British farmer and grazier, in connection with the domestic animals of the homestead, and an authority in all matters relating to the grazing and breeding of cattle. Previous to the appearance of the first edition of his work, nothing had been published at all adequate to the importance of the subject. "Culley on Live Stock," which may be considered the only standard work, although valuable so far as it went, was meagre and dry in its details, and hardly worthy of the high reputation the writer sustained as a successful practical breeder and grazier, a duodecimal work of about 222 pages, comprising all that the most eminent graziers in England could find to write on a subject on which Bakewell and the Collings had thrown so much light. When, therefore, Youatt's work appeared, giving not only a full history of the various breeds of cattle and other domestic animals of the farm, but interspersing the whole with telling anecdotes, illustrative of their habits, related in a graphic and entertaining style, and displaying, at the same time, a knowledge of his subject that indicated deep study, combined with practical and personal observation, it may be readily conceived that it was received at once, not only with favour, but with applause, and became the standard and text book with the farmer and grazier, a position which it has ever since maintained in every agriculturist's library.

No greater proof of the truth of what we have stated can be adduced, than that the book before us is the eleventh edition of Mr. Youatt's work; and Mr. Scott Burn has done well to bring it out, the former editions having long been out of print; whilst the vast improvements in grazing and breeding, as well as in general husbandry and the management of the farm, required that such alterations and additions should be made in the work as the advanced state of agricultural science and practice requires. Thus, whilst adhering to the general features of the original work, the editor has rewritten, in a great measure, those chapters relating to the feeding of cattle, &c., and the preparation of their food; the soiling of cattle; the arrangement of farm-buildings and cottages; the varieties and uses of implements, and machines;

on draining, sewage, irrigation, and on liquid manures; whilst those on the breeding, rearing, and general management, &c., of all animals of the farm, and of everything connected with husbandry, as the piggery, the poultry-yard, the dairy, &c., &c., are treated in a concise but clear and familiar style. We shall adduce a few instances in which modern discovery is treated of.

"Some attention has been given, within a few years, to a discovery made by M. Guénon, respecting the 'escutcheon,' as it is termed. It can scarcely have escaped the reader's notice that the hair on the buttocks of cattle grows in two different directions, one portion pointing up and another part downwards, and thus producing a sort of fringe at the point of juncture. This hair, which has an upward tendency, has been termed the 'escutcheon.' A very extended observation has proved that, *other conditions being equal*, the modification of form presented by the escutcheon will lead to an estimation, not only of the *quantity* of milk which the animal will produce, but also of the *time* during which the animal will *keep up the supply* of milk. Without going much into detail on this point, I may briefly state that the larger the extent of the escutcheon, the greater the promise of milk, and also of the continuance, even after the cow is again in calf. It may be considered a point of merit, not as *deciding* whether or not the cow is a good milker, but rather as an additional indication, which may be taken into consideration in conjunction with other characteristic points. Besides the escutcheon, there are tufts of hair (*épis*), which have a certain degree of value when seen upon the udder of a cow." Then follow the rules, with pictorial illustrations, by which the milking character of the cow may be ascertained.

On the grazing of cattle there is ample room for additions to the original work. Box and stall-feeding are much more general than they were twenty or thirty years ago, and the cooking of cattle food, whether right or wrong, is practised to a large extent. On these subjects the work enlarges, giving the proportions of food, whether cooked or raw, allotted to the cattle by eminent graziers. The great increase of artificial articles of food introduced since Youatt's time has afforded ample

room and subject for additional matter in the book. All the latest inventions and improvements in implements and machinery are described, with their uses and excellences, especially steam cultivation, which practically is entirely a new system since Youatt wrote. The subject of artificial manures also affords ample scope for additions to the work; also draining, the comparative value of different kinds of cattle food, the facilities afforded in har-

vest work by the mower and reaper, &c., &c.; all these and a thousand other innovations in husbandry have rendered it necessary almost to re-write the entire work, taking the original for the basis. And this the editor of the present edition has done, and as such we recommend it to the attention of the public, as affording a body of useful information on every department of husbandry.

THE METEOROLOGY OF JANUARY.

On the 28th of December the weather became somewhat colder, the barometer on the same day reaching its maximum value of 30.18 inches. The depression of mean temperature for the day below its average value amounted to $1\frac{1}{2}^{\circ}$, and the lowest temperature on the day was 29° . But on the following day, with a rapid barometric fall, the wind changed to S.W., and blew forcibly from that direction, recording pressures of 12 and 13 lbs., and causing the weather to become much warmer. Thus the mean temperature for this day exceeded its average by no less an amount than $10\frac{1}{2}^{\circ}$, whilst on the 30th, with the wind blowing less forcibly from the N.W., the mean temperature for the day also exceeded its average, but by a less amount, namely, $2\frac{1}{2}^{\circ}$.

A decided change took place on the 31st of December, when the wind turned to E., and for the next nineteen days continued either from that quarter or from one of its compound directions N.E. or S.E. The primary effect of this sudden alteration was a decided change to severely cold weather, which prevailed until the 9th day. The coldest days of this period were the 6th and 7th, and the lowest temperatures observed on those days were respectively 15° and 14.3° , whilst a thermometer placed on grass at the same times fell to 7° and 6° . Throughout the whole of these two days the thermometer never increased to the point 32° , the respective maximum temperature for these days having been 28° and $29\frac{1}{2}^{\circ}$; and the mean values fell below their averages to the amounts of 15° and $13\frac{1}{2}^{\circ}$. The departures below the average temperature values on the other days of this period were respectively $9\frac{1}{2}^{\circ}$ on the 5th, between 8° and 9° on the 4th and 8th, $7\frac{1}{2}^{\circ}$ on the 3rd, $6\frac{1}{2}^{\circ}$ on the 2nd, and less than 4° on the 31st of December and 1st and 9th of January. The wind on the 1st of January was in somewhat rapid motion, and indicated frequent pressures of 7 lbs. on the square foot, which was one of the causes of the subsequent dryness of the atmosphere, the degrees of humidity on the 1st, 2nd, 3rd, 5th, and 6th being represented by the several amounts of 60, 67, 62, 59, and 61. Another, and perhaps more powerful cause which operated in producing this extraordinary dryness of the atmosphere, was the almost entire stoppage of the ordinary sources of evaporation by the sudden severe frost; for, although evaporation takes place from the surface of ice, yet its amount is not at all commensurate with that from the free surface of water.

It only remains to notice with respect to this period, that a little rain fell on the 31st December;

and snow fell in small quantities on the 2nd and 3rd of January; that the 6th day was extremely fine and cloudless throughout, and that fogs were prevalent on the 7th and 8th.

From the 10th to the 18th a damp, cloudy, and somewhat warm period generally prevailed, accompanied throughout by a S.E. wind. The mean temperature of this period exceeded the average value by the amount of $1\frac{1}{2}^{\circ}$; and on several days very small diurnal ranges occurred, namely, 2° on the 13th, 4.2° on the 14th, 4.6° on the 15th, and 5.8° on the 16th. Rain fell on the 12th, 13th, 14th, and 17th to the collective amount of 0.39 inch, and fogs prevailed on the 13th, 14th, 17th, and 18th. On the 19th the wind changed to S.W., and continued from this quarter till the end of our period, accompanied by very high temperatures. The mean excess of daily temperatures above average values amounted to 6.7° , and the actual amounts of excess in the several days were as follows: On the 22nd, $12\frac{1}{2}^{\circ}$; on the 23rd, 11° ; $8\frac{1}{2}^{\circ}$ on the 20th and 21st; and nearly 8° on the 19th and 27th. On the 20th, the small range of temperature of 4° only occurred, whilst on the 27th the range was as large as 16.1° . Rain fell on the 20th, 21st, 23rd, and 24th, amounting to 0.44 inch; and a dense fog prevailed on the morning of the 25th.

Glancing over the tables of results, we find that the highest barometer reading occurred on the 3rd of January, and was 30.48 inches; the lowest was 29.55 inches, on the 31st of December, giving a range for the month of almost an inch. The highest temperature in the shade was 54.0° , on the 27th, and the lowest 14.3° on the 7th: giving the large range of 39.7° . The highest reading in the rays of the sun was 77° , on the 27th: the lowest of the grass was 6° , on the 7th. The dampest day in the month were the 13th, 18th, and 25th; the driest day was the 5th. The total amount of rain collected from the 28th of December to the 27th of January was 0.90 inch, which fell on nine days, both being below their average values.

The remarkable prevalence of easterly wind during the greater part of the past month has been its chief characteristic. The cold temperature at the commencement was entirely counterbalanced by the warm weather which followed, and the mean for the entire month scarcely differed from the average values. The warm period, however, prevailed during the greater portion of the month, and the progress of agricultural operations has therefore been greatly retarded,

METEOROLOGICAL ELEMENTS FOR THE NEIGHBOURHOOD OF LONDON;

FROM DECEMBER 28TH, 1863, TO JANUARY 27TH, 1864.

Month and Day.	Temperature of the Air in Shade.			Highest Reading of a Thermometer in the full Rays of the Sun.	Temperature of Vegetation.*	Degree of Humidity. (Saturation=100).	Amount of Cloud, 0 to 10.	Amount of Rain.	General Direction of the Wind.	Weather Remarks.
	Highest.	Lowest.	Mean.							
1863.	°	°	°	°	°			Inches.		
Dec. 28	41.3	28.9	35.6	43.3	21.8	77	9.8	0.00	S.E.	Generally cldy ; a little snow
29	52.0	40.7	47.8	52.0	39.2	87	9.8	0.00	S.W.	Generally overcast
30	46.4	33.3	40.0	46.4	32.8	88	4.3	0.00	W., N.W.	Cldy. day ; clear night ; haze
31	40.0	27.9	35.7	44.2	26.0	97	8.8	0.07	E., E.N.E.	Generally ovcast.; rain at ngt.
1864.										
Jan. 1	35.5	30.9	32.9	39.0	30.5	60	6.5	0.00	N.E.	Partially cloudy
2	34.5	25.2	29.8	36.8	18.6	67	9.5	0.00	N.E.	Generally cldy.; a little snow
3	34.5	23.5	28.7	47.8	17.0	62	6.3	0.00	N., N.E.	Gen. cldy.; a little snow mrn.
4	32.8	22.0	27.8	44.0	18.0	74	3.0	0.00	N.E.	Fine clear day ; cloudy night
5	33.5	21.7	26.6	47.2	17.2	59	3.8	0.00	E.	Cloudy morn. ; clear night
6	28.1	15.0	21.1	35.0	7.0	61	0.0	0.00	S.E.	Clouds.all day; haze; hoar f.
7	29.8	14.3	22.6	32.0	6.0	79	10.0	0.00	E.	Overcast generally ; fog
8	31.8	23.7	27.3	42.0	22.0	75	3.3	0.00	N., E.	Cloudy morn. ; foggy nigh
9	38.3	21.6	32.4	59.0	19.5	95	7.5	0.00	S.E.	Clear morn.; day overcast
10	45.6	36.6	40.1	64.0	31.6	84	6.7	0.00	S.E.	Light clds. prevailed gener.
11	46.7	34.9	39.5	73.0	30.2	78	1.3	0.00	S.E.	Fine; few cl.mrn.;clr.afterw.
12	41.4	32.2	37.2	55.0	25.0	92	8.3	0.02	S.E.	Generally cldy.; rn. at night
13	38.0	35.9	36.9	39.6	33.7	98	10.0	0.14	E., N.E.	Ovcast.; rain fell genly.; fog
14	38.2	34.0	36.2	39.3	31.9	94	10.0	0.01	N.E., E.	Overcast ; thin rain ; fog
15	34.5	29.9	32.5	39.4	25.7	89	10.0	0.00	S.E.	Overcast ; a little fine rain
16	38.2	32.4	35.0	48.0	29.0	75	8.5	0.00	S.E.	Generally cloudy
17	42.6	32.5	36.8	42.6	28.2	95	10.0	0.22	S.E.	Overcast ; rain ; dense fog
18	44.8	38.0	41.3	45.0	38.0	98	9.8	0.00	S.E.	Generally ovcast.; foggy mrn
19	48.2	40.7	44.4	68.9	38.4	87	9.5	0.00	S.W.	Generally overcast.
20	47.8	43.6	45.2	57.5	43.1	90	10.0	0.15	S.W.	Overcast ; rain morning
21	48.8	41.3	45.3	55.2	41.0	89	8.3	0.06	S.W.	Generally cldy. ; rain morn.
22	53.0	44.4	49.9	55.7	41.2	90	10.0	0.00	S.W.	Overcast ; fine rain
23	53.2	45.9	48.5	56.9	40.0	81	10.0	0.04	S.W.	Overcast ; occasional rain.
24	45.8	34.2	39.0	53.0	26.0	83	2.0	0.19	N.W.,S.W.	Rain early ; cloudless day
25	42.6	34.5	39.1	45.6	28.5	98	10.0	0.00	S.W.	Overcast ; dense fog morn.
26	45.8	35.1	40.3	74.6	26.0	80	5.5	0.00	S.	Partially cloudy ; fine
27	54.0	37.9	46.1	77.0	35.7	92	6.0	0.00	S.W.	Partially cloudy ; variable

* The "temperature of vegetation" is that obtained from a self-registering thermometer placed on the grass at night. It is therefore a minimum reading for the previous twenty-four hours.

TABLE SHOWING THE PRINCIPAL FLUCTUATIONS IN THE ATMOSPHERIC WAVE, FROM DECEMBER 28TH, 1863, TO JANUARY 27TH, 1864.

1863-64.		Reading of Barometer.*		1864.		Reading of Barometer.*	
Month, Day, and Hour.		Highest.	Lowest.	Month, Day, and Hour.		Highest.	Lowest.
		Inches.	Inches.			Inches.	Inches.
Dec. 28,	9 a.m. ..	30.18		Jan. 14,	3 p.m. ..	30.11	
Jan. 29,	3 p.m. ..		29.70	" 15,	9 p.m. ..	30.18	
" 30,	9 a.m. ..	30.00		" 17,	noon ..		29.81
" 31,	9 p.m. ..		29.55	" 20,	9 a.m. ..	30.14	
" 3,	9 p.m. ..	30.48		" 28,	9 a.m. ..		29.64
" 9,	9 a.m. ..		29.77	" 25,	noon ..	30.30	
" 11,	9 a.m. ..	30.00		" 27,	9 a.m. ..		29.85
" 12,	noon ..		29.94	" 27,	noon ..	29.87	
" 13,	9 a.m. ..	30.18					

* All the readings are reduced to the constant temperature of 32 degs.

CALENDAR OF AGRICULTURE.

This month is generally very favourable for the operations of ploughing, which must be pushed vigorously in leys and stubbles, and in subsoiling. If the season be unfavourable, and frosts and thaws prevail, continue the operations of carting, as directed last month. Feed all live stock regularly and amply, and thrash regularly in order to afford fresh straws.

Reckoning the weather favourable, pull turnips, and store the roots; use them in succession now, green rounds and swedes. Give oilcake to the cattle along with turnips, 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 mothers, and they will nourish the young.

Lay dung on grass lands when dry, bush-harrow and roll, and pick off by hand all rubbish from the ground. 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; plash hedges and plant new ones. Plant all kinds of forest trees, and cut over those planted last year to ensure a more vigorous growth in the new saplings that spring from the stem. Open ditch plantations, and fence the enclosures against the summer grazings of the pasture fields. 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 on for sets. Collect and prepare all kinds of artificial manures.

In early seasons, the sowing of grain will commence in early districts. Sow beans and peas, oats and barley, and spring wheat. Sow also spring vetches for horses and sheep feed. Sow on warm, well-prepared border grounds, cabbage seeds for plants to go to the fields in May or June.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Hotbeds of dung and leaves, or of leaves only, collected from woods, or by rakings of timber parks, which contain much withered grass—these must now be prepared for raising cucumbers and melons, and for obtaining early asparagus and potatoes. No time nor materials are thus wasted, even on the busiest farms, for much manure is prepared, and an early supply of vegetables is obtained—a most agreeable provision, and not easily got by any other means.

The intervals of fine weather generally permit the operations of spade and fork. Peas, beans, carrot, parsnip, onion, and beet-root, may be sown in ground prepared in autumn in the effectual manner before described.

Asparagus plots should be particularly attended to. To attain bulk of plants, give the adequate means by preparing proper beds in four double rows on highly enriched lands, which will produce abundantly for twenty years. The rows of plants must be twelve inches asunder, with an equal space outside the rows; the beds will be three yards wide. Besides the beds, there must be an alley between them, and one at both remote ends; thus the entire space required will be 17 or 18 feet, the length of the rows being arbitrary.

The ground must be deeply trenched, and perfectly drained. Bad soils must be removed, and replaced by fresh turfy loam which is incorporated with a third of its bulk of decayed farm-yard dung. Bone dust, guano, salt, sulphate of ammonia, and some chalk are usefully applied. The matters being duly blended and deposited, the beds will stand high above the level ground, and remain to settle till Lady-day.

A similar preparation will be desirable for sea-

kale, artichokes, and rhubarb, which will all of them remain fertile for several years.

Sow twice or oftener spring spinach, lettuce, salads, radish, and at the end of the month carrots, onions, leeks, and some varack cabbage.

Paraley: Sow a full crop in edgings or in beds: it will grow for two years, but a yearly fresh sowing is best. Late in the month, sow the sweet herbs of thyme, hyasop, marjoram, and savory; and, if wished, sow the fancy herbs of salsify, borage, lavage, burnet, angelica, coriander, and chervil. Prepare good loamy soil for garlick and shallots.

FRUIT DEPARTMENT.

Gooseberries and currants: Proceed with pruning, as the buds will be breaking. Retain a good supply of the best young wood, spurring but little. Currants require a rigid spurring to produce the fruit in closer clusters. Retain about six canes in each raspberry bush; cut these back to the bud, just under the part where the cane takes a bend, then collect and tie them neatly at the summit. Milch over the ground around the plants, and remove the wandering suckers.

Prune any wall fruit trees, pear and apple espaliers, and all the spur-bearing fruit trees.

Strawberries: Beds and borders may now be planted. Deep new ground is essential, and the best kinds are Keen's for an early and prolific crop; Pines and the Queens for mediums; and the delicious Elton's for the latest supply.

FLOWER GARDEN.

Sow annual seeds of the best sorts in pots or pans about the end of the month. Light rich oam with leaf-mould, or very old cattle dung, orms a good compost; a very gentle heat in a rame will be useful. The common hardier sorts

are raised under glass in the same way, as convolvulus, lupines, sweetpea (which is best raised in rows in autumn), Venus' looking-glass, dwarf lychnis, candytuft, &c., &c.

In the open grounds, worms, snails, and slugs very often destroy the young plants as they emerge.

At the end of the month, in dry weather, a dressing of leafy and rotten dung compost may be spread upon and pointed in over the flower-beds; but best to renew every bed a foot deep with fresh earth, leaf-loam, heath-mould, or any finely comminuted alluvium. For such purposes, these aids are most imperatively required.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR JANUARY.

On the whole, the weather during the past month has been favourable for agricultural operations. The severe frost experienced in the second week, whilst it kept the wheats in check, was highly beneficial to the land; and the return of mild weather during the last three weeks enabled our farmers to re-commence ploughing, with the soil in a good friable state. Notwithstanding that less wheat was thrashed out than in the previous month, and that only moderate supplies (partly in very middling condition) were exhibited in our various markets, the demand for most kinds was in a sluggish state, and prices had a drooping tendency. Even the greatly diminished stocks of foreign produce in warehouse—the total quantity being about 1,400,000 qrs. less than at the corresponding period in 1863—have had very little influence upon the trade. The alleged great deficiency in the Indian corn crops in America has led to a great number of orders being remitted to the Black Sea ports for the shipment of wheat to this country in May and June; but the demand for foreign wheat on the spot has been restricted to very moderate quantities, on rather lower terms. The advance in the Bank rate for money to 8 per cent., and the heavy shipments of bullion to the East, have induced great caution on the part of the leading millers in entering into operations beyond immediate wants. Although the news from the Continent is somewhat fertile, it is not anticipated that any serious obstacle will be thrown in the way of grain exports to this country during the spring. The hat crop of wheat continues to thrash out remarkably well, both as regards quantity and quality; and most of the millers admit that it yields a large quantity of fine flour. There has been considerable inactivity in the grain trade on most parts of the Continent, at slightly depressed rates. In America, produce has sold slowly for export purposes; nevertheless, fine wheat and flour have commanded full currencies. Our latest advices show the following shipments to the United Kingdom from the 1st September, 1863, to the 11th of January, 1864:

	Flour. barrels.	Wheat. bushels.	I. Corn. bushels.
1863-4	415,170	5,317,084	289,459
1862-3	397,499	12,102,802	3,412,276
1861-2	894,265	11,009,803	5,219,477
1860-1	1,089,154	12,129,767	2,680,540

From the above comparison it will be seen that the shipments of flour since September last have somewhat increased when compared with the previous season, but that there has been a great falling off in those of wheat and maize. The result is that very little really fine American produce is now on sale in this country.

Fine malting barley, though in fair average supply, has commanded a steady sale, and the quotations have been well supported. In grinding and distilling sorts, however, the transactions have continued on a moderate scale, at about previous rates.

Milk, oats, beans, and peas, have been in somewhat improved request, at full prices. Fine flour has produced quite as much money as in the previous month; some parcels, however, have been much neglected.

The wool trade has been tolerably firm as regards value; but the business doing has fallen-off, owing to the high range

in the value of money. The total imports of wool into England, in 1863, amounted to 595,326 bales, against 567,668 bales in the previous year. Included in these quantities are 375,010 bales colonial for the former, and 345,605 bales for the latter year. The export demand has fallen-off to some extent: yet holders are not disposed to force sales.

Rough fat has slightly improved in value, the present quotation being 2s. 1½d. per 8lbs.; but the demand for tallow has not increased. The stock of tallow in London is now 66,321 casks, against 52,268 do. last year, 49,572 in 1862, 72,937 in 1861, and 39,518 in 1860. It will be perceived, from these figures, that the supply in warehouse is a full average one.

The imports of foreign hops have amounted to about 3,000 bales; nevertheless, the demand for all kinds has been tolerably active, and prices have had an upward tendency. The quantities of home-grown hops in the bands of the factors are now very moderate. Some of the foreign hops have arrived in excellent condition.

There has been only a moderate inquiry for both hay and straw, at about previous currencies. Meadow hay has realised £3 to £4 10s., clover £4 to £5 10s., and straw £1 6s. to £1 10s. per load.

Large supplies of potatoes, in, for the most part, good condition, have been on sale; and the demand for them has ruled steady, at from 65s. to 100s. per ton. The arrivals from the continent have been on a very moderate scale.

Only limited supplies of wheat have been on offer in the Scotch markets; yet most kinds have changed hands slowly on former terms. Fine barley and oats have realised extreme rates. In other articles, the transactions have been on a very moderate scale.

In Ireland, the corn trade, generally, has been very inactive and the quotations have been with difficulty supported. The shipments of grain to England have fallen-off.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The leading markets of consumption held since our last have been but moderately supplied with beasts as to number, but the general quality of the stock exhibited has been remarkably good—indeed, we may call it prime. For nearly all breeds, the demand has been tolerably active, and the quotations have been well supported. In the Great Metropolitan Market, the best Scots and crosses have averaged 5s. per 8lbs. The supplies of sheep have somewhat fallen-off; nevertheless, owing to the large quantities of dead meat forwarded to Newgate and Leadenhall from Scotland and various parts of England, the mutton trade has been far from active, at rates about equal to the previous month. The best Downes have found buyers, at 6s. per 8lbs. About 300 foreign and 500 shorn home-fed sheep have made their appearance, and which have sold at about 1s. per 8lbs. beneath those in the wool. Wool is, we know, a valuable commodity in most parts of England; but we doubt the policy of very early shearing, since it is well known that "chilled" mutton is frequently difficult of disposal. Many of the sheep imported from Holland have arrived in first-rate condition, and have sold at prices equal to some of our best half-breeds; whilst

not a few of them have been purchased by West-end butchers. In the quality of the German sheep, however, very little improvement has taken place. The lamb trade has opened well. The lambs from Dorsetshire and Somersetshire have changed hands at from 6s. 8d to 7s. 4d. per 8lbs. No change of importance has taken place in the value of calves. The demand for them may be considered steady. There has been a fair sale for pigs, at from 3s. 6d. to 4s. 6d. per 8lbs.

The imports of foreign stock into London were as follows:—

					HEAD.
Beasts	..	..	..	..	2,823
Sheep	..	..	..	..	5,511
Calves	..	..	..	..	1,405
Pigs	..	..	..	..	168
Total					9,907
Total in Jan. 1863					11,893
"	1862	..	..	..	8,783
"	1861	..	..	..	2,706
"	1860	..	..	..	6,760
"	1859	..	..	..	9,264
"	1858	..	..	..	2,342
"	1857	..	..	..	4,633
"	1856	..	..	..	3,292
"	1855	..	..	..	9,102
"	1854	..	..	..	7,919

The total supplies of each kind of stock exhibited in the Great Metropolitan Market were:—

					HEAD.
Beasts	..	..	..	..	19,442
Cows	..	..	..	..	452
Sheep	..	..	..	..	80,230
Calves	..	..	..	..	1,019
Pigs	..	..	..	..	2,567

COMPARISON OF SUPPLIES.

Jan.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1863.....	20,455	450	83,422	1,637	2,456
1862.....	20,360	502	82,160	853	2,850
1861.....	17,612	505	75,240	677	2,000
1860.....	20,500	535	92,425	1,067	2,045
1859.....	19,805	364	90,620	921	2,400
1858.....	20,312	572	80,742	1,108	1,759
1857.....	19,947	355	81,300	1,071	2,355
1856.....	17,532	435	101,600	757	2,930
1855.....	19,717	500	120,460	962	2,625
1854.....	19,687	510	95,080	887	2,279

The bullock arrivals from our own districts, as well as from Ireland and Scotland, thus compare with last year:—

	Jan. 1864.	Jan. 1863.
Norfolk, Suffolk, &c.....	9,600	8,770
Other parts of England ...	3,400	4,000
Scotland	1,590	1,710
Ireland	380	820

Beef has sold at from 3s. 6d. to 5s., in some instances at 5s. 2d., mutton 3s. 8d. to 6s., veal 4s. to 5s. 6d., and pork 3s. 6d. to 4s. 6d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	Jan., 1860.		Jan., 1861.	
	s. d.	s. d.	s. d.	s. d.
Beef,..... from	3 4	5 0	3 2	5 2
Mutton	3 8	5 6	3 6	5 0
Veal	4 6	5 8	4 2	5 6
Pork	3 6	4 10	4 0	5 0
	Jan., 1862.		Jan., 1863.	
	s. d.	s. d.	s. d.	s. d.
Beef,..... from	3 2	4 10	3 4	4 10
Mutton	3 4	5 6	3 6	5 10
Veal	4 8	5 8	3 8	5 0
Pork	3 10	4 10	3 8	4 8

Very large quantities of meat have been on sale in Newgate and Leadenhall markets, and the general demand has ruled inactive, as follows: Beef from 3s. to 4s. 4d., mutton 3s. 6d.

to 4s. 6d., veal 4s. to 4s. 10d., and pork 3s. 6d. to 4s. 8d. per 8lbs., by the carcase.

Advices from Scotland, Norfolk, and Holland state that the supplies of stock on hand are seasonably large, and that rather large numbers will be forwarded to the Metropolis during the next four or five months. Our impression is, however, that prices will rule high for a considerable period.

SOUTH LINCOLNSHIRE.

It is a long time since we had such favourable winters as the present and the past. It is beyond my recollection. The winter of 1827-8 was exceedingly fine, and farm work progressed then as now. Cross-ploughing was then and now in general, and all work very forward. The very reasonable and highly beneficial frost, just now passing away, has retarded field work for a few days, but it has done an immense service. We in South Lincolnshire have been singularly situated throughout this season. We have no water in our ditches, none in our cisterns, and but little in our wells. The very few men complain of scarcity of water. Our fields are all dry, and the lairage for sheep on our winter green-crop fields is all that can be desired, consequently they are healthy and doing well. The crops of winter food were very scant, but the surprising weather has scarcely injured a plant, and all is being fed off with great cleanliness, and without waste. The price of cake and other artificial food is lower than usual, but this has not hindered the consumption of corn and corn-mead—a mode of feeding which is annually on the increase. The “mode of feeding” cattle and sheep is becoming an important feature in agricultural economy. The quantity of beans, peas, oats, barley, tallow wheat, and Indian corn now ground down to meal or administered in grain to stock, is immense. It has become a prime article of food for cattle and sheep, and unless adulteration of cake ceases, or greatly subsides, it will continue to increase; and so long as the price of corn remains low, no better course can be pursued. This question naturally arises, What should farmers do with average returns, who consume such large quantities of their own produce on their farms? It is only the best qualities of corn that now find their way to market; all inferior qualities are made the best use of at home, and it thus finds its way to market in the shape of beef, mutton, and pork, to say nothing of poultry. Owing to this inferior produce not coming into the market, a considerable addition is made to the corn averages by which our tithes and corn rents are regulated. Some notice ought to be taken of this important change in farm economy in the coming session of Parliament, and permission should be obtained for farmers to make returns of the value of corn consumed upon their farms, being the produce thereof. It is, in fact, according to the practice of some of our new lights in agriculture, who sell the produce of the field to the stock of the farm. I only desire for this stock the privilege of making a return of what they consume, at its value. Just consider the quantity of oats and beans consumed by the cart-horses and others, the barley and peas and tallow or inferior wheat consumed by cattle, sheep, pigs, &c. It now comprises, on average, on most farms, farmed after the modern school, of about one-third of the produce. But to return. The wheats are looking well, and not too forward. The fens are perhaps too dry, and should this weather continue much longer, so a danger will arise from loss of plant. Our winter-crop crops kept progressing up to the very eve of the frost. We shall not lack keeping now, although many fears were entertained on that point. We have never held such a light stock of beef and mutton as at the present time; our country butchers scarcely know where to go to supply their wants. Pork is in tolerable abundance, but not so cheap as in the autumn. Wool is almost “a thing of the past”; we scarcely know of a clip yet left. Store sheep were never much higher in price, and if the course of fattening now pursued is to continue, there is but little chance of much change. A depreciation in the price of wool would have some effect, but it is counter-balanced by the universal fattening of lambs and young sheep. Store cattle are nearly as dear as sheep. Pigs are the only cheap animals fatted for food. Potatoes keep indifferently in grave; prices scarcely remunerating.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

AYLESBURY FAIR.—On Friday last this fair was held in the market-place. The quantity of lean cattle, consisting of milk and barren cows, heifers, store beasts and calves, was large, but something less than last year. There were a good many buyers from the grazing districts, and dairymen near London; prices were considered high, exceeding those given a fortnight since by at least £1 per beast. From £30 to £33 were given for cows in full profit or near calving, and £16 to £19 for smaller do. and heifers in calf; best barren cows £16 to £18, others £10 to £13 per head. Three-year-olds and steers £9 to £12 per head. Fat beasts 4s. 6d. to 4s. 10d. per 8lbs. Calves for rearing 25s. up to 60s. each. A very small fair of fat and lean sheep; the few pens of fat wethers and tegs were quickly sold at 5s. 6d. to 6s. per 8lbs. Store tegs and ewes were generally poor, and of but moderate prices; tegs made 30s. to 35s., ewes 35s. to 45s. each. Heavy horses in quick demand; best nag horses £40 to £45 each, others at £30 to £35, inferior £20 to £25, cobs £20 to £25, best Welsh and other ponies and colts £13 to £18 each.

BANBURY FAIR was well supplied. The cow trade was brisk, fine shorthorns making high prices if within one or two months of calving. Graziers and dairymen from the neighbouring counties purchased freely those animals brought out of Bucks, Oxfordshire, Beds, and Herts, some reaching from £22 to £24 each, others from £19 to £21 each. Heifers from £16 to £18 each. Store beasts, large Herefords, shorthorns, or Scotch, rising three years old, made from £11 to £14 each; two years old do. from £8 to £9 each. Welsh and other small beasts from £7 to £10 each. Weaned calves, cow kind, sold at from 30s. to 60s. each; bull do. from 20s. to 40s. each. Best fat beasts reached from 4s. 8d. to 5s. per stone, ordinary do. from 4s. to 4s. 4d. per stone. Prices were considered quite equal to those given at the last autumn fair. There were ready purchasers for all light and heavy horses of from four to six years. Very fine horses, warranted fit for the hunting field or carriage pairs, sold at high figures. The highest prices for best hunters or carriage horses, from fifteen to sixteen hands, ran from 70 to 80 guineas, next in shape and usefulness from 45 to 50 guineas, cobs from £30 to £35, neat ponies from £15 to £20, best agricultural horses from 40 to 50 guineas, others at from 25 to 35 guineas.

BRIDGNORTH FAIR.—The show of good fat cattle and sheep was both useful and compact. Good cows for the knife realised 7d. to 7½d., and good wether sheep went at 9d. to 9½d. per lb. Mr. Nock had a most successful sale of stock in his Smithfield, and made 9d. to 9½d. per lb. of some excellent wethers. Cows and calves fetched £12 to £16. In the pig fair useful bacon pigs fetched 5½d. to 6d. per lb., and pork pigs from 6d. upwards.

CUPAR-ANGUS MONTHLY MARKET was exceedingly well attended, and there was a first-rate display of prime fat stock, besides a fair show of animals of good quality, though not so highly fed. Sales were brisk for the best beasts; and although the market was easier in the other descriptions, all the cattle brought forward changed hands. Prime fat sold at almost 11s. per Dutch stone, secondary quality from 10s. downwards. The following transactions may be noted: Mr. Bett, Flatfield, sold four stots at £27 10s. each; Mr. Buttar, Carston, sold two stots to a Glasgow dealer at £25 each; Mr. Watson, Feattie, sold a fine white heavy bull for £25, two stots for £24 15s., and a cow at £17 5s.; Mr. Small, dealer, Copar-Angus, sold a fat cow for £21 5s. A good lot of gimmers were bought by a Dundee slasher for 80s. each.

DONCASTER FORTNIGHTLY MARKET.—We had a very large supply of both beasts and sheep, and there being a quite good attendance, the trade was more than usually animated. Beef was in much request at prices varying from 7s. 9d. to 8s. 3d. per stone. Mutton sold well at about former prices, viz. 7d. to 8d. per lb.

DUMFRIES PORK MARKET.—This morning was wet and cloudy, and the pork came to market in a rather soft state to be favourable for curing. Business opened slowly, and sales were not at all brisk. Prices were about the same as last week for light carcasses, but for heavy sorts were less. The number of carcasses shown was 520, and a great many were heavier than dealers will give the top price for. Prime light carcasses at the beginning of the market brought 6s. 9d. to

6s. 10d., but towards the close they would fetch no more than 6s. 8d. and 6s. 9d.; secondary carcasses were from 6s. 6d. to 6s. 8d.; and heavy from 6s. upwards.

ELGIN MONTHLY MARKET.—There was a fair exhibition of stock, and a good many buyers. Cattle in good condition readily changed hands at full rates. We subjoin a few of the sales effected: Mr. Rose, Sheriffston, sold a lot of queys at £33 10s. each; Mr. Keir, Burnside, a lot of old stots at £16 each; Mr. Ray, Sunbank, a lot of three-year-old polled at £28 each; Mr. Smith, Woodlands, a lot of Highlanders at £11 each; Mr. Cameron, Hopeman, a pair of Highlanders at 60 gu.; Mr. W. Smith, Easter Kellas, a lot of queys at £14 12s. 6d., and another lot at £7 10s. each; Mr. Wiseman, Oakenhead, a pair of queys at £23; Mr. Forsyth, Langmorn, a lot of stots at about £11 each.

FORRES SECOND FAT STOCK MARKET.—No former market in Forres ever exceeded this one in the number, quality, and value of the stock exhibited and sold. Fat stock was chiefly in demand. Of this description there was abundance, and the demand was almost equal to the supply. There were ten times as many cattle on the Green as we ever remember to have seen in any market at this season of the year. Among the sales were the following: Mr. Mackessack, Grangegreen, sold a lot of 20 three-year-old polled stots at £24 each, and another lot of 12 at £23; Mr. Mitchell, Wester Alves, a beautiful lot of prime two-year-olds at £30 a-head; Mr. Macpherson, Culrossie, 8 heifers at £15; Mr. Walker, Altyre, a lot of 13 two-year-olds at £22 10s.; Mr. Shaw, Inverne, sold a fat cow at £18; Mr. Mackessack, Belnaffery, a lot of crosses at £21 each, and a lot of 20 three-year-olds at £22 10s. Cows changed hands at prices ranging from £12 to £18.

GLASTONBURY MONTHLY MARKET was well attended. Cows and calves were in great demand, and found ready purchasers at £12 to £14. Sheep and pigs about an average.

HUNTLY MARKET was large, and a good business was done at rather less money. Best fat might be selling at from 68s. to 64s. per cwt.

KNIGHTON FAIR was well stocked. Purchasers were more easily effected than of late, a depression being experienced in all kinds of stock. Beef 6½d. to 7d., mutton 7d. to 7½d. Store cattle sold easier. Fat pigs brought 5d. per lb.

NOTTINGHAM FAIR.—There were a tolerably good number of store beasts shown, chiefly from the grazing districts of our own neighbourhood. The show of horses was very small comparatively speaking, and the quality was only middling. There was a fair amount of business done, at prices which could not fail to prove remunerative to the sellers. Young beasts fetched from £9 to £15., and milk cows from £17 to £20. It would be rather difficult to frame a list of prices for horses, the quality was so poor, and the quotations so very various.

OSWESTRY FAIR.—The quality of the stock was good, and both private sales and by auction realised high prices. Our quotations are for beef 6d. to 7d., mutton 8d. to 9d., and fat pigs 8s. 6d. the score lbs.

SHREWSBURY FAIR.—There was a seasonable supply of stock, with plenty of buyers, and a brisk trade for beef and mutton of first-class quality. Good cows and calves in demand, and consequently dear. Barrens also sold better. Beef ranged from 6½d. to 7d., and mutton from 8d. to 8½d., calves 7d., bacon pigs 5½d. Store wethers 45s. to 55s. Store pigs low.

ST. COLUMB MONTHLY MARKET was well supplied, and good fat bullocks sold at from £3 to £3 3s. per cwt. There was a great demand for sheep, which sold as high as 8d. and 9d. per lb. It was an excellent market for selling.

TEWKESBURY FAIR was attended by a large number of butchers and dealers. Beef made from 7d. to 7½d., mutton 7½d. to 8½d.

WORCESTER FAIR.—The show of fat stock was very good in beef and mutton; attendance of buyers large, and a very good clearance made. Fat sheep: ewes 8d., wether 9d. to 10d. per lb. for some very few prime ones, beef 6½d. to 7d., and a few prime ones made 7½d., and sold very readily; great inquiry for good barrens and good cows and calves, the former very dear, milk a shade lower. Pigs: Porks 10s., bacon 8s. 6d. to 9s. per score.

IRISH FAIRS.—ATHLONE: We had an excellent fair. Our fair green was not better supplied with stock for some years past, while buyers were plenty and disposed to give an advanced price on all kinds of stock. We have seen more sheep offered at this season, and the supply of this animal may have been short, but the quality was first-rate, and top lots went off at 2s. to 3s. over prices at late fairs. Fat cattle averaged from £14 to £20; store heifers, three-year-olds £9 to £14; two-year-olds £8 to £11; weanlings £3 to £6. Sheep, widders 48s. to 65s.; ewes, 42s. to 50s. Pigs were abundant: between two and three thousand of this animal changed owners. Bacon sold at 42s. per cwt. The horse fair was not so large as last year, but a better class of animals was exhibited. General prices ranged from £20 to £60; farm horses from £10 to £20, and a good deal of business was transacted. **GRANARD:** Fat cows and stall-fed bullocks ranged from £18 to £22 per head, being at the rate of from 62s. to 64s. per cwt. of this description of stock. Three-year-old bullocks and heifers appeared in good demand, and rated at from £11 to £18 15s. each. Two-year-old heifers of a good description met with ready purchasers, at from £9 to £12 each; second quality rated from £7 to £10 12s. per head. Milch cows of a good quality were in brisk demand, some of which brought a very high figure; several lots of a top quality were sold at from £12 to £16 per head, second quality rated at from £8 to £9 10s. each. Yearlings rated from £6 to £6 10s. each. The supply of sheep was large; wethers were sold at from 48s. to 57s. each, ewes from 44s. to 49s. per head, lambs rated at 25s. to 27s. each. The show of bacon and store pigs was large; bacon hogs went to a very large figure, some of which went as high as £6 17s. 6d. to £7 each, others of a light description from £4 10s. to £5 10s. each. Stores appeared to look with a downward tendency, and could be readily purchased at from 38s. to 40s. per head. Slips went from 18s. to 25s. The horse fair was but thinly supplied, and the quality may be termed only of a second-rate description. A few strong farm-horses were sold in the early part of the day at from £12 to £14 10s. each. **SLANE:** Beef, prime quality 65s. per cwt., second quality from 55s. to 60s., and inferior coarse beasts from 48s. to 50s. per cwt. sinking the offal. Store cattle fully maintained late rates. Two-year-old bullocks were worth £8 to £9 10s., and yearlings from £4 to £7 per head; three-year-old heifers from £12 to £18 10s. each. Springers were scarce, and dearer than last fair. Wethers brought as much as £8 10s. per head. Fully 7½d. per lb. may be quoted for wether mutton, and ewe 6½d. to 7d. per lb. Pork 45s. per cwt. Store pigs from £3 to £2 each. Of sucklers and weanlings a large number were purchased at a slight reduction in value. **DUNDALK:** There was a good attendance of buyers, but stock was very scarce and dear, the only exception being pigs, of which there was an unusually large supply. All were bought up freely at £2 5s. per cwt. for bacon pigs, and at the rate of £2 for stores. Beef very high, from 6d. to 7½d. per lb.; milch cows ranged from £9 to £18. The show of farm-horses and small ponies was good, but there were no first-class horses offered for sale, nor was there much business done in this department of the fair. **TULLOW** was largely supplied with every description of stock, and well attended with buyers. The following is a list of the prices: Beef sold at from 55s. to 63s. per cwt., mutton at from 7½d. to 8½d. per lb., strippers at from £9 to £14, springers at from £11 to £18, two and a-half years old at from £11 to £12 10s., one and a-half years old at from £7 10s. to £9. The pig fair, which was held on the previous day, was the largest we have seen for some time, and was well attended with buyers. Pork sold at from 48s. to 52s., bacon pigs at from 55s. to 58s. per cwt.

CORK BUTTER EXCHANGE, (Saturday last).—The supply of butter this week was small but steady, averaging about 250 firkins daily. The market was rather dull, with little change in prices. Since Monday firsts and seconds, which are becoming scarce, remained at 117s. and 112s.; thirds fell from 100s. to 97s., fourths rose from 85s. to 87s., and fifths from 76s. to 78s. The supply of mild cured has been so trifling that its price is merely nominal at 119s., 117s., 107s., for firsts, seconds, and thirds.

CARMARTHEN BUTTER MARKET, (Saturday last).—

A small quantity of butter offered, which was firm at 119s., and the country and holders are now run out of stock. The deliveries for the remainder of the season will be merely nominal, not worth noticing, so we shall suspend our reports until the spring butters are offered, when they will be resumed as usual.

SALISBURY MONTHLY CHEESE MARKET.—There was rather a brisk sale, upwards of 150 tons having been pitched. Skims 26s. to 32s., half Cowards 48s. to 52s., Wiltshire 56s. to 60s., Somerset, 60s. to 70s. per cwt.

GLASGOW, (Wednesday last).—Supply of cheese moderate, with a fair business for the season. About ten tons passed the weigh-house scales; Dunlop new 58s. to 61s., Cheddar made new 56s. to 62s., skim milk 26s. to 23s. per cwt.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, Jan. 25.—We note a very dull trade for want of the proper quality.

Dorset, fine None.
 " middling 80s. to 94s. per cwt.
 Fresh 12s. to 16s. per doz. lbs.

PRICES OF BUTTER, CHEESE, HAMS, &c.

BUTTER, per cwt.—	118 to 120	Cheshire.....	62 to 74
Priland.....	94	Double Gloucester.....	60 to 64
Jersey.....	108	Cheddar.....	64 to 72
Dorset.....	—	American.....	44 to 46
Carlisle.....	98	Waterford.....	98
Waterford.....	98	HAMS: York, new.....	70 to 84
Cork.....	98	Do. Cumberland.....	60 to 64
Limerick.....	98	Do. Irish, new.....	60 to 64
Sligo.....	98	Do. Bacon: Wiltshire, dried, 50 cwt	60 to 64
Fassau, per doz. 12s. 6d. to 16s. 6d.		Do. Irish, green.....	60 to 64

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, MONDAY, Jan. 25.—During the past week the arrivals coastwise have been moderate, but very plentiful by rail, and towards the end of the week less money had to be submitted to. The following are this day's quotations:—

Yorkshire Flukes per ton 80s. to 90s.
 " Regents 65s. to 75s.
 " Rocks 55s. to 60s.
 Dunbar Regents 70s. to 75s.
 Kent and Essex Regents 60s. to 70s.
 Perth, Forfar, and Fifeshire Regents 50s. to 60s.
 " Rocks.. 50s. to 55s.

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, Jan. 25.—The arrivals of home-grown Potatoes, by land and water-carriage, are moderately extensive. The trade rules firm for nearly all qualities, and fine samples command rather more money. There is no foreign produce on offer.

Yorkshire Regents 85s. to 95s. per ton.
 Ditto Flukes 100s. to 110s. "
 Ditto Rocks 70s. to 75s. "
 Scotch Regents 60s. to 80s. "
 Ditto Rocks 65s. to 70s. "
 Kent and Essex Regents .. 80s. to 90s. "

COUNTRY POTATO MARKETS.—MANCHESTER' Saturday last: Potatoes 5s. to 8s. 6d. per 252lbs. **YORK:** Saturday last: Potatoes are not only profuse in quantity, but excellent in quality, and there does not appear any probability of an advance in price. They are selling at from 5s. to 5s. 6d. per tub of 280lbs., and 5d. to 6d. per peck retail, according to quality.

CHICORY.

LONDON, SATURDAY, Jan. 23.—Our market is well supplied with most kinds of chicory, and the trade is inactive, at late quotations.

DELIVERABLE FROM WHARF IN BAGS, EXCLUSIVE OF DUTY

HARLINGEN.....	£9 10 0	£11 10 0
BRUGES.....	9 10	10 10
ANTWERP.....	9 10	10 10
HAMBURGH.....	9 10	10 10

BREAD.

LONDON, SATURDAY, Jan. 23.—The Prices in the METROPOLIS are, for

WHEATEN BREAD, per 4lbs. Loaf .. 6½d. to 7d.
 HOUSEHOLD BREAD " .. 5d. to 6d.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The first month, very near its commencement, gave us a taste of so severe a frost as to affect the navigation above London Bridge; and though it lasted only a week, the London mortality was increased by 1,600 victims. But since the 11th, an unusually mild temperature has falsified the predictions of the weather-wise, and suggested the possibility of an early spring. The frost, however, was highly serviceable to the soil. Ploughing, with other field work, has been efficiently resumed; and though some damage has been sustained by the potatoes and other vegetables, the progress of slugs and injurious insects has had a smart check. The land having previously been dry, no accounts have reached us of any harm being sustained by the growing wheat; on the contrary, it is universally said to look well; but the trials of a fluctuating spring may yet diminish our prospects on the ground. The openness of the weather before Christmas brought up the arrears in planting, and we reckon that a full average of this important work was done under favourable circumstances. As to the progress of prices, we can say nothing satisfactory. Only one market opened well, and that was the first, and the gain of that day was more than lost on the third; so that rates have suffered about 1s. per qr. In fact, a heavy crop like the last can never be placed freely without the aid of speculation. This was, indeed, commencing with every prospect of success till the double rate of discount diverted the surplus of capitalists to a surer source of profit. The ever-changing phases of the Schleswig-Holstein question have also been against any onward movement; and the possible early opening of the Baltic, after such unusual severity, induces a further spirit of caution. The Danish affair, however, has now become so complicated, that an European war may break out without design, and involve our country in the calamity, notwithstanding our reluctance to engage in it; and this would soon give the growers of corn their proper position [as respects remuneration and importance. It will be seen that foreign imports have sunk to previous dimensions: the last four weeks amounting only to 431,694 qrs. wheat, 477,645 cwt. flour; and the total imports of 1863 being 5,670,803 qrs. wheat, 5,265,835 cwts. of flour; against 9,542,359 qrs. wheat and 7,314,311 cwts. flour in 1862; making a deficiency of more than 4} million quarters of wheat, while we began the year with a considerably reduced stock of foreign. What have we got of our own? and what are foreign countries likely to send us? are, therefore, questions of no small moment. To the first question, we can unhesitatingly say, "plenty!" But can farmers, after long years of waiting, be expected to act like Jack on his return home after a long and perilous voyage?—that is, "part with all for nothing?" We think not, but we leave it to their determina-

tion. We cannot answer the second question with the same certainty, because that must partly be dependent upon "peace," and secondly upon "stores," which, though good in the Baltic, may all be blockaded, while in America they are diminished and diminishing by the mad spirit of war, which, if it last long enough, will make the whole of America an importing country, as it has been in times past. Let growers who have not sold out now judge for themselves. There have been little differences in the values abroad since our last, and we give them as recently reported. Fine native wheat at Paris has been selling at 42s. to 43s.; red American at Antwerp was worth 43s. 6d.; at Louvain, native wheat was 45s.; at Maestricht, in Holland, the value of native was 42s.; at Hambro', red marks and Saale were worth 42s. for spring; at Danzig, the best new high mixed 43s. to 44s. for spring, fine old almost exhausted and very dear; Stettin quoted 38s. to 39s. for red wheat; the quotations at Straubing were 37s. to 39s. 6d.; at Porrentruy, in Switzerland, 41s. to 43s. 6d.; at Cologne, 40s.; Venice 45s. 6d., native wheat at Turin to 52s. 6d., Odessa wheat 49s. 6d., Buhi wheat at Alexandria 31s., soft wheat at Algiers 45s. 6d. per qr. With nothing stirring at Montreal the value of Upper Canada spring wheat was 30s. 11d. per qr. New York still oscillating with the value of gold and the exchange by last accounts, made the value of Chicago spring wheat about 32s., Milwaukee 32s. 6d., red winter 36s., all per qr. of 480 lbs.

The first week in London opened on small supplies of wheat, both native and foreign. A north-east wind having set in, with only a small show on the Essex and Kentish stands, this was a brisk market, holders at first insisting on an advance of 2s. per qr.; but they were not able to obtain more than 1s. from millers, and on these terms there was a fair clearance made. In the absence of speculation, not much was done in foreign; but the retail sales made for consumption showed an improvement of 1s. per qr. Cargoes afloat, though full-priced, did not command higher rates. The sharp weather and cheerful London advices had their full effect on the country markets; nearly all places of note were 1s. per qr. higher, and some were up 1s. to 2s. per qr.—as Hull, Barnsley, Rochester, Rugby, Newark, Sleaford, Worksop, &c. Liverpool was 3d. per cental dearer for wheat on Tuesday, and this advance was maintained on the following market. Glasgow and Edinburgh noted the same improvement as London, being up 1s. per qr. Dublin was also rather dearer, and all the Irish markets very firm.

The second Monday in Mark-lane began on a small English, but larger foreign supply. The show of samples from the near counties was small; but a thaw having set in, buyers appeared to have

lost courage, though factors were only asking former rates. A few parcels only were sold, the remainder being passed over for Wednesday's chance. In foreign very little was doing; but holders were not disposed to give way, and this was also the case with floating cargoes, there being but few arrivals. The thaw being decided, produced a similar effect on many country markets; but some held out, and among them were Hull, Ipswich, Market Harborough, Melton Mowbray, Malton, Rugby, and Bury St. Edmonds. At most of these places there was a good enquiry without change of value; but Birmingham, Bristol, Boston, Newbury, Stockton, and many other towns, were 1s. per qr. lower, Newark giving way 1s. to 2s. Liverpool was dull on Tuesday, and 2d. per cental lower on Friday. Edinburgh was firm, and Glasgow somewhat improved, in consequence of speculation. The Irish markets were generally well supported. It was so at Dublin, both for native and foreign wheat.

The third Monday opened on a moderate arrival of wheat, both English and foreign. The fresh supply during the morning from the near counties was on a limited scale; but, added to the over-left samples of the previous week, there was a fair show. The mixture gave a stale aspect to the stands. For a long time nothing was done; but finally a portion was got rid of at a decline of 2s. per qr. In foreign but little was passing; and to have effected sales fully 1s. per qr. less must have been accepted, especially on new samples. Cargoes afloat were, however, firm.

The fourth Monday began on a rather better English supply, with large arrivals from abroad, chiefly American. The show of samples this morning from Kent and Essex was but small, and the condition, considering the damp weather, very fair; but buyers were wanting for the bulk. A contract being out, some of the driest lots went off at the previous currency; but most was unsold, factors refusing to take less money. The foreign trade was dull enough for consumption; but some speculative orders being on hand for red American, there was no alteration in prices. Cargoes afloat were little in request, but not cheaper. The country markets, for the most part taking their complexion from London advices, were very heavy, without any decided change.

The imports of wheat into London for four weeks were 27,486 qrs. English, 71,064 qrs. foreign, against 12,691 qrs. English, 84,909 qrs. foreign in 1863. The general averages commenced at 40s. 5d., and closed at 40s. 11d.; those of London at 46s. 7d. to 44s. 4d., making the depression greatest in the metropolis.

With the exception of the first Monday, the flour trade has been exceedingly dull through the month; and though quotations have scarcely been lowered for any one market, to make sales a reduction of fully 1s. per sack must have been accepted on country samples, and 6d. per barrel on American. Foreign sacks participated in the depression, but town prices have undergone no change, the top quotations being 40s. per sack. The imports into London for four weeks were 66,796 sacks country-made, 9,068 sacks 34,993 brls. American, against

64,144 sks. country, 3,730 sks. 46,445 brls. foreign for the same time in 1863.

Barley throughout has also been very dull, the samples of malting exhibited in the London markets being mostly short of the requirements of maltsters. Medium descriptions have been still more difficult to quit, and these, together with all sorts of foreign, have given way 1s. per qr., inasmuch that grinding qualities have been procurable at 22s. per qr., weighing 50lbs. per bushel. We think the latter, however, have about reached their lowest. The imports into London for the four weeks were 17,668 qrs. British, 47,464 qrs. foreign, against 15,560 qrs. English, 68,772 qrs. foreign in 1863.

The malt trade, like that of barley, has been very heavy, but without any quotable decline in the value of fine samples.

Oats have been no exception to the rule of dullness, even with only moderate foreign supplies, the second week excepted, which perhaps was as brisk a day as any, there being quantity to work with. Prices have been about the same for fine old corn, which is now very scarce, and choice new; but the inferior descriptions and parcels out of condition have given way 6d. to 1s. per qr. Future rates will much depend on the political issue of the Danish question: should there be peace, and an early opening of the Baltic, new corn may remain dull and low, but there are equal chances of some improvement. The importations into London for four weeks were 27,126 qrs. English, 2,016 qrs. Scotch, 16,837 qrs. Irish, 95,789 qrs. foreign, against 19,582 qrs. English, 1,638 qrs. Scotch, 4,078 qrs. Irish, 88,711 qrs. foreign in 1863.

The frost was too short to give any life to the bean trade, which, with very small foreign supplies, has been heavy throughout the month, and about 1s. per qr. lower for new English samples, these now being cheaper than Egyptian; and the latter being comparatively dear at Alexandria, we cannot expect any further decline. The imports into London for four weeks have been 4,780 qrs. English, 1,954 qrs. foreign, against 3,048 qrs. English, 16,352 qrs. foreign in 1863.

Peas have been no exception to the generally dull state of things. English clays and other sorts of hog-feed have declined about 1s. per qr., and white boilers have been very little in request, the frost not having lasted long enough to bring them into demand, but any contracts for the navy might send them up in value. The imports into London for four weeks were 2,058 qrs. English, 7,400 qrs. foreign, against 1,621 qrs. English, 1,081 qrs. foreign in 1863. So it is well that foreign have not further yielded in price.

There has been a very fair importation of linseed; but with short stocks on hand, these imports have been anticipated, and prices have not been shaken. Cakes have continued in fair demand, at about former rates.

The seed trade, as is usual at this time of year, has been without much interest. More English cloverseed has been exhibited, but fine samples appear scarce, and somewhat improved in value; so have all foreign red cloverseed, prices having risen in the places of growth; but white seed has

COVENT GARDEN MARKET.

LONDON, SATURDAY, JAN. 23.—The return of mild weather has had a favourable effect upon the market, which is now well supplied with vegetables. Pine Apples, too, considering the time of year, are tolerably plentiful. Hothouse Grapes are now beginning to get scarce, as are also good Pears. Some good samples of Blenheim Orange and American New Town Pippin Apples may still be obtained. Kent Cobs are good, and Oranges are plentiful; the best are realising from 4s. to 7s. per 100. For Potatoes the market is still heavy. Cornish Broccoli is arriving in large cratesful. French Lettuces, Endive, and Radishes begin to make their appearance. Cut flowers chiefly consist of Orchids, Pelargoniums, Primroses, Mignonette, and Roses.

FRUIT.

	s. d.	s. d.	s. d.	s. d.
Pineapples, per lb.	6	0	8	0
Grapes, per lb.	3	0	12	0
Apples, per sieve	3	6	4	0
Pears, per sieve	4	0	10	0
Melons, each	2	0	4	0
Lemons, per 100	5	0	8	0
Oranges, per 100	4	0	7	0
Nuts, small, per bushel	14	0	18	0
Almonds, do.	18	0	0	0
Walnuts, do.	14	0	20	0
Kent Cobs, per 100 lbs.	11	0	0	0
Chestnuts, per bush.	10	0	16	0

VEGETABLES.

	s. d.	s. d.	s. d.	s. d.
Cabbages, per doz.	1	0	2	0
Gaslow, do.	0	0	0	0
Asparagus, per bundle	6	0	3	0
Spinnage, per punnet	2	6	3	0
Khubarb, per bundle	0	9	1	6
Potatoes, York Regents	0	0	0	0
per ton	50	0	0	0
Shaws, do.	50	0	0	0
Turnips, per bunch	0	4	0	8
Carrots, do.	0	6	0	8
Spinach, per sieve	1	6	2	0
Best, per dozen	1	6	0	0
Endive, each	1	0	2	0
Celery, per bundle	1	6	3	0
Shallots, per lb.	0	0	0	10
Garlic, per lb.	0	0	0	8
Lettuces, each	0	1	0	4
Horseshak, per bunch	1	0	0	4
Mushrooms, per pottle	1	0	1	9
Parley, per 12 bunches	3	0	4	0
Herbs, per bunch	0	0	0	3

HAY MARKETS.

LONDON, SATURDAY, JAN. 23.—SMITHFIELD.—Trade inactive.

CUMBERLAND.—An inactive market.

WHITEHAPPEL.—Trade slow.

	SMITHFIELD.	CUMBERLAND.	WHITEHAPPEL.
MEADOW HAY	80 0	110 0	87 6
CLOVER	80 0	110 0	87 6
STRAW	24 0	32 0	26 0

At per load of 36 Trusses.

TIMBER.

LONDON, SATURDAY, JAN. 23.—There is only a limited demand for all kinds of timber. In prices, however, very little change has taken place.

	Import Duty	Christians & Sanderson	s. d.	s. d.
Per load 50 cubic ft.	1s. per Load.	Deals, White & Yel. 12	0	15 0
Fir, Riga	76 0	to 75 0	0	10 0
Dantisc and Memel	80 0	to 85 0	0	10 0
best middling	78 0	to 80 0	0	10 0
gd. do. second	65 0	to 70 0	0	10 0
common do.	55 0	to 60 0	0	10 0
small, short, do.	50 0	to 55 0	0	10 0
Stettin	50 0	to 60 0	0	10 0
Swedish	50 0	to 54 0	0	10 0
anal.	45 0	to 50 0	0	10 0
Swedish Norway	50 0	to 60 0	0	10 0
Oak, Memel, crown	110 0	to 130 0	0	10 0
brack	80 0	to 100 0	0	10 0
Dantisc and Stettin	90 0	to 110 0	0	10 0
brack & unseasoned	50 0	to 70 0	0	10 0

	Import Duty	Christians & Sanderson	s. d.	s. d.
Walnsoc (Per log 18 cubic ft.)	80 0	to 100 0	0	10 0
Riga, crown	70 0	to 72 0	0	10 0
brack	75 0	to 85 0	0	10 0
Memel and Dantisc	65 0	to 65 0	0	10 0

	Import Duty	Christians & Sanderson	s. d.	s. d.
DEALS & BATTENS.	2s. per Ld.	Christians & Sanderson	4	0
standard burr (s. d.)	14 11 16 0	to 15 0 0	0	0
Archangel and Omega	11 0	to 11 10	0	0
Seconds	12 10	to 13 10	0	0
Petersburg	10 10	to 11 10	0	0
Wyburg	10 10	to 11 10	0	0
Fisland and Hand-	7 11	to 9 0	0	0
awa Swedish	8 15	to 9 10	0	0
Petersburg and Riga	14 0	to 15 0	0	0
White Deals	14 0	to 15 0	0	0
Memel and Dantisc	14 0	to 15 0	0	0
crown Red Deals	9 0	to 10 0	0	0
Ditto brack	9 0	to 10 0	0	0

HIDE AND SKIN MARKETS.

	s. d.	s. d.	s. d.	s. d.
MARKET HIDES:	0	24	0	2
54 to 54 lbs.	0	3	0	3
54 to 70 lbs.	0	3	0	3
70 to 80 lbs.	0	3	0	3
80 to 84 lbs.	0	3	0	3
84 to 86 lbs.	0	4	0	4
86 to 104 lbs.	0	4	0	4
104 to 112 lbs.	0	0	0	0
HORSE HIDES, each	9	0	10	6
CALF SKINS, light	3	0	4	0
Do. full stand	7	0	8	0
Polled sheep	11	0	14	0
Kents and Half-breeds	9	0	10	6
Downs	7	0	9	0
Shamings	0	0	0	0
Lambles	0	0	0	0

WOOL MARKETS.

ENGLISH WOOL MARKET.

CITY, MONDAY, JAN. 25.—Although money in the general discount market has advanced in price, there is an improved feeling in the demand for nearly all kinds of Wool, and prices generally are well supported. For export, however, the inquiry is somewhat restricted. The supplies on offer are by no means extensive, and the stocks in the hands of the dealers are very moderate.

	Per lb.	Is. 5d.	To 2s. 1d.
Shropshire—Down tegs	1 11	1 11	1 11
do. ewes	1 4	1 4	1 4
do. lambs	1 2 1/2	1 2 1/2	1 2 1/2
Southdown tegs	1 5	1 5	1 5
Leicestershire—Ewes and wethers	1 2 1/2	1 2 1/2	1 2 1/2
do. Lambs	1 11	1 11	1 11
Somersetshire—Ewe and wether	1 2 1/2	1 2 1/2	1 2 1/2
Hertfordshire—Ewe and wether	2 1	2 1	2 1
Lincolnshire—Hoggets	1 6 1/2	1 6 1/2	1 6 1/2
do. Ewe and wether	1 10 1/2	1 10 1/2	1 10 1/2
Wiltshire, Hampshire, &c.—Tegs	1 9 1/2	1 9 1/2	1 9 1/2
do. Ewe and wether	1 9 1/2	1 9 1/2	1 9 1/2
do. Lamb	2 1 1/2	2 1 1/2	2 1 1/2
Kent—Tegs	2 0	2 0	2 0
do. Ewe and wether	1 6	1 6	1 6
do. Lamb	1 9 1/2	1 9 1/2	1 9 1/2
Norfolk, Suffolk, and Essex—Tegs	1 8 1/2	1 8 1/2	1 8 1/2
do. Ewe and wether	1 8 1/2	1 8 1/2	1 8 1/2

LEEDS (ENGLISH AND FOREIGN) WOOL MARKETS, Friday.—There is little change in the state of the English wool trade since our last. The undiminished consumption tends to keep up prices, which are quite as high among the country dealers as among the woolstaplers here. For clothing wool the demand is quiet, and prices range much lower than some persons were inclined to expect, as both English wool and cotton have advanced so much. There is no speculation in colonial and other foreign wool.

LIVERPOOL WOOL MARKET.—Jan. 23. SCOTCH.—There continues to be a moderate demand from the trade to supply immediate wants only, prices being high, and stocks for the season of the year unusually light.

	s. d.	s. d.
Laid Highland Wool per 24 lbs.	17 6	to 19 6
White Highland do.	20 0	to 21 0
Laid crested do. unwashed	20 0	to 21 0
do. do. washed	21 0	to 23 0
Laid Cheviot do. unwashed	23 0	to 25 0
do. do. washed	26 0	to 31 0
White Cheviot do. washed	33 0	to 44 0

FOREIGN.—There is still a fair inquiry for good long-stapled clean wools, to substitute for English, and for such full current rates are obtained, while for an unwashed and heavy-conditioned there is still very little demand.

MANURES.

	PRICE CURRENT OF GUANO, &c.
Peruvian Guano, direct from the importers' stores, or ex ship (30 tons)	£12 5s.
Bones, 26; crushed, 26 10s. per ton.	
Animal Charcoal, (70 per cent. Phosphate) £5 per ton.	
Coprolite, Cambridge, (in London) whole £3 5s. to £3 5s., ground £3 to £3 3s.; Suffolk, whole £1 18s. to £2, ground £2 10s. to £2 14s. per ton.	
Nitrate of Soda, £15 10s. to £16 per ton.	
Sulphate of Ammonia, £15 to £16 per ton.	
Gypsum, 30s. per ton. Superphosphate of Lime, £5 to £5 5s. p. ton.	
Sulphuric Acid, concentrated 1-645 lb. per lb., brown 1-712 qd.	
Blood Manure, 25 5s. per ton. Dissolved Bones, £6 10s. per ton.	
Lined Cakes, best American, £10 10s. per ton, ditto £10 to £10 10s. per ton; English, £10. Rape Cake, £5 10s. per ton.	
Cottensend Cake, £5 10s. to £6 per ton.	

E. PURSER, London Manure Company, 116, Fenchurch Street, E.C.

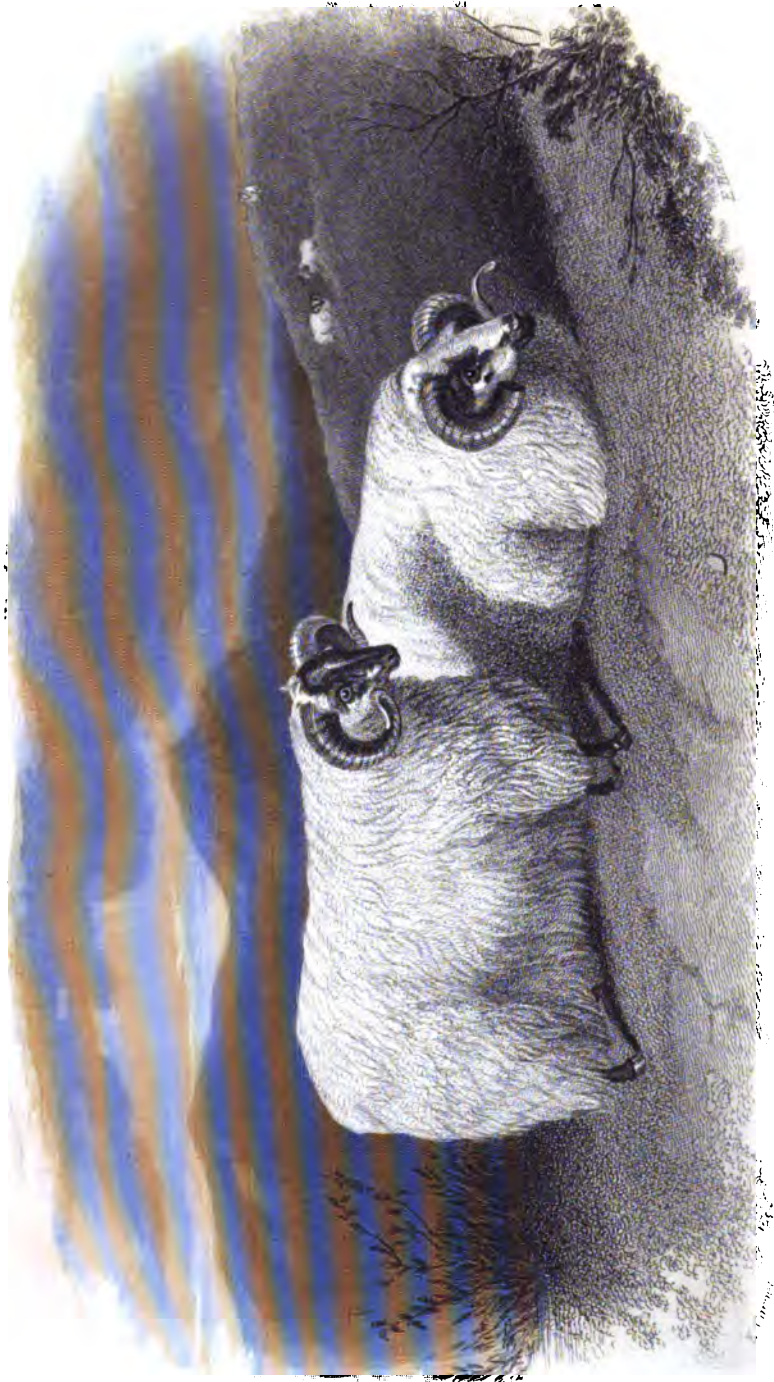
LIVERPOOL SEED AND GUANO, &c., MARKET.

	Price	Price
Guano, Peruvian £12 7 6 to £13 8 0		Lined Cakes, per ton
Do. Upper do 8 17 6	8 0 0	Americ. Chis. Sgs. £8 15 0 to 9 0 0
Patagonian do 0 0 0	0 0 0	Do. in brls. 9 15 0 to 9 0 0
Kooria Morina 3 10 0	0 0 0	English 9 5 0 to 9 10 0
Bone Ash 4 15 0	0 0 0	Contd. Cakes, assort. 7 10 0 to 7 15 0
Saltpetre, Bengal, 3 per cent. 1 17 6	2 0 0	Brimstone, 2d & 3d 7 5 0 to 8 0 0
Clewsed, new 1 18 0	2 0 0	Nitr. of Soda, p. ct. 0 14 0 to 0 15 0
red, per cwt. 1 18 0	2 0 0	Tallow, lat P.Y.C. 2 4 0 to 2 6 0

SAMUEL DOWNES and Co., General Brokers, Exchange Court, Liverpool.

	Price
Agricultural Chemical Works, Stowmarket, Suffolk.	
Pratt's General Manure for Corn Crops	per ton £3 10 0
Mangold Manure	per ton 3 10 0
Pratt's Turf Manure	per ton 6 10 0
Pratt's Superphosphate of Lime	per ton 6 0 0

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



Black-faced Mountain Rams.

The First prize tops on this several classes at the Battersea Meeting of the P. A. S. of England, June

1871. Taken from the book 'The Mountain Rams'.

PLATE V.

BLACK-FACED MOUNTAIN RAMS;

THE FIRST PRIZE TUPS IN THEIR SEVERAL CLASSES AT THE BATTERSEA MEETING OF
THE ROYAL AGRICULTURAL SOCIETY.

The first ram of the two in the print, distinguishable by his broken horn and speckled, rather than black, face proper, was exhibited at Battersea by his breeder, Mr. Gavin Sandilands, of North Cumberhead, Lesmahagow, N.B., and who took with him the first prize in the old class of not more than four-shear sheep. Mr. Sandilands has had a black-faced flock for a considerable period, and not only this tup, but his ancestors for many generations, were bred at Cumberhead. Previous to starting for the South, the Battersea ram had gained a great reputation in his own country, having won fourteen or fifteen premiums at Lanark, Muirkirk, and Lesmahagow—all in the heart of a black-face district, as well as at Glasgow; and never, in fact, suffered defeat on the show ground. The first prize ewes and hogs exhibited by Mr. Sandilands in Paris in 1856 were all of the same blood as this ram, which, as a breed, their owner maintains are much more adapted for Scotland, and with much finer mutton than the white faces. They stand the inclemency of the weather better than any other sort, and Mr. Sandilands says that on the hills he can keep *five* black faces to *four* white, to do better and pay more.

The yet more picturesque ram on his legs was the first prize shearling, bred and exhibited by Mr. Drife, whose flock at Battersea was also first for shearing ewes, with second prizes for old rams and old ewes. Mr. Drife, we hear, has left the

Barr Farm; during his time his success as a breeder and exhibitor of sheep was deservedly very great.

We have, in recording our own repeated visits to the Meetings of the Highland Society, continually spoken to the many merits and distinguished appearance of these hardy mountaineers; while Mr. Robert Smith thus welcomes them over the Border, in his report on the Battersea Show, as already given in the "Farmer's Magazine":—

"These are a most useful breed for the purpose assigned them—a mountain life. They can endure the hill top, and rough it through every snowy blast where even the Cheviot would succumb, and the Leicester be cast away. They range over the mountainous districts at the highest altitudes, and are distinguished by their large horns, mottled faces and legs, fierce-looking eyes, and long carcasses, covered with long, open coarse wool. They carry from 4 to 5lbs. of wool, are seldom fed until from three to five years old, giving excellent mutton, with highly flavoured gravy, and weigh from 16 to 18lbs. per quarter. They only want a better fleece of wool to make them one of the most valuable breeds of mountain sheep in Britain. They are brought down to the Falkirk, Melrose, Lockerby, and other autumnal fairs, in large droves, where they are met by the dealers and graziers from the southern districts. Lanark and Douglas Water in Perthshire are also famous districts for these sheep. No breed has been more spiritedly improved."

PLATE VI.

MACARONI; A THOROUGH-BRED COLT.

THE PROPERTY OF MR. C. R. NAYLOR, OF HOOTON HALL, CHESHIRE.

Macaroni, bred by the Marquis of Westminster, in 1860, is by Sweetmeat out of Jocose by Pantaloon, her dam Banter (Touchstone's dam) by Master Henry—Boadicea by Alexander.

Sweetmeat, bred by Mr. A. W. Hill, in 1842, was by Gladiator, out of Lollypop, by Starch or Voltaire, her dam Belinda, by Blacklock. Sweetmeat was a capital racehorse, while at the stud he figures as the sire of Macaroni, a winner of the Derby, Mince-meat and Mince-pie, both winners of the Oaks, Sweetsauce, winner of the Goodwood Cup, Parmesan, winner of the Ascot Vase, Peppermint, Comfit, Citron, Trifle, Nettle, Confectioner, Brown Brandy, Spicebox, Saccharometer, and many other successful performers.

Jocose, bred by the late Lord Westminster, in 1843, distinguished herself when in work by once

beating Inheritress, for the Cleveland Cup at Wolverhampton. She went to the stud in 1848; but, though with twelve or thirteen foals credited to her account, numbers nothing amongst them to compare with the Derby winner. The old mare is still at Eaton.

Macaroni is a bay horse standing rather over fifteen-two. He has a plain head, with a commonish strong neck, but good oblique shoulders, great depth of girth, large ribs, a powerful back, and a big barrel. He is altogether a small horse, not very noticeable for either bone or power; in fact, not a taking one to the eye, and it is not until he is fairly set a-going that you begin to fancy him.

Macaroni was one of a lot of yearlings purchased by Mr. Naylor, of his neighbour Lord Westminster.

THE FOOD WE FATTEN WITH.

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

There is hardly any inquiry more important to the farmer than that which relates to the food of his live stock. The progress of discovery, has here, as in all other branches of agriculture, been very gradual. We are aware that turnips were not grown as a field crop in England till about the 15th century, although they had been long before this time cultivated by the farmers of Gaul. And as for oilcake, we have no notice of its use for stock before the 16th century. Tusser, who died about the year 1580, does not even mention it in his "Husbandry." He dwells, however, in one or two places upon the value of peas as a winter food for cattle. For instance, in his "November Husbandry," he directs:

"(For Easter) at Martinmas hang up a beef;
For stall-fed, and peas-fed, play pick pure the thief."

And in his "December Husbandry" he directs for cattle feeding:

"Serve rye-straw out first, then wheat-straw and pease,"
Then oat-straw and barley, then hay if ye please."

It is certain, however, that long before Tusser's days cattle had been fed with oilcake in Southern Europe; for in the year 1211, the Government of Milan, in compliance with a then existing prejudice, prohibited the selling of meat so fattened. As soon indeed as men began to use oil obtained by crushing seeds, oilcakes of various kinds must have been produced; but we see from the Milan decree, that even in the 13th century the use of this kind of food for stock must have been very ill understood.

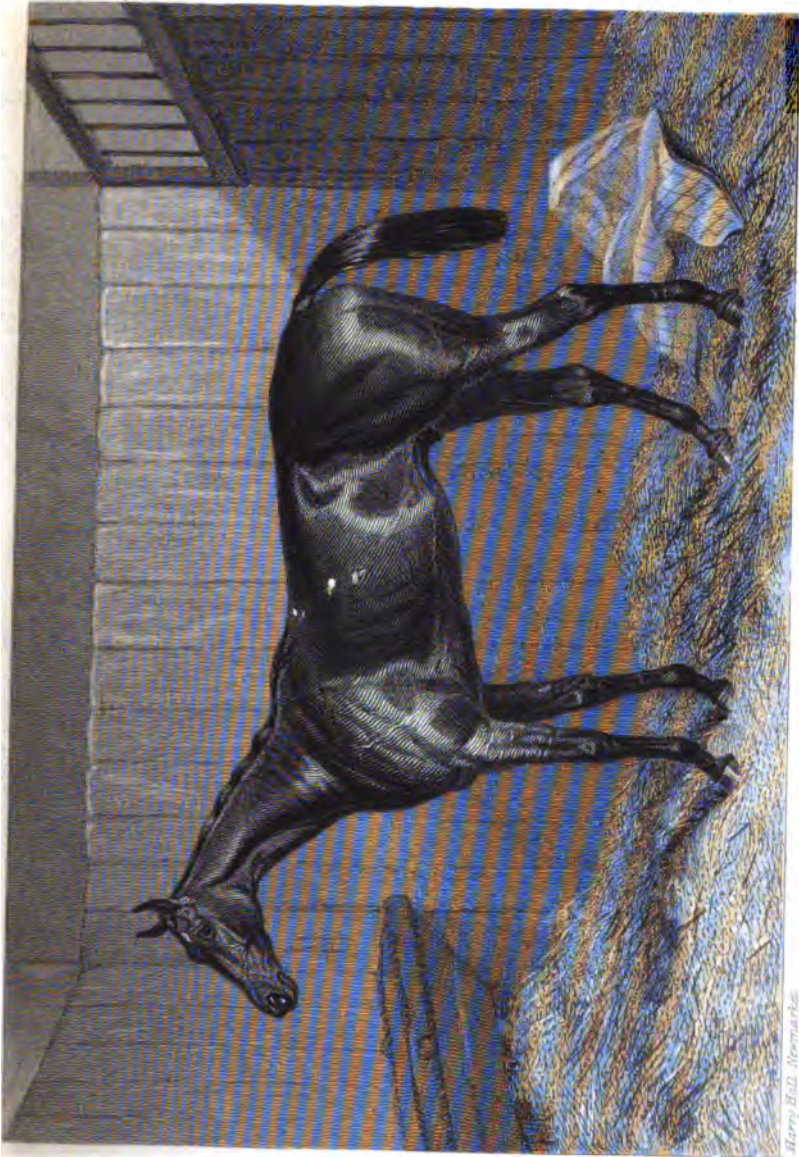
The progress of knowledge and the aid of science to the stock-owner have long removed many absurd prejudices, but the field has still considerable harvests to be gathered. The chemist's examinations, indeed, seem

never to terminate. Thus some recently published researches of Professor Anderson (*Trans. High. Soc.* 1863, p. 109) were upon the comparative feeding qualities of tares and "peas brock." Peas brock being the name applied to the outer skin of the pea, which is removed by a particular process of grinding in making split-peas. This "brock," adds the Professor, is used pretty extensively for feeding stock, being sold for this purpose at about £6 to £6 10s. per ton. The result of Dr. Anderson's analysis was per cent, as follows:

	Tares.	Peas Brock.
Water	15.36	.... 9.36
Oil	1.87	.... 2.82
Albuminous compounds	20.06	.... 9.00
Starch, sugar, &c.....	53.93	.... 41.51
Fibre.....	5.34	.... 33.59
Ash	3.44	.... 3.75
	100.00	100.00
Nitrogen	3.21	.... 1.44
The ash contained:		
Phosphates	0.54	.... 0.68
Sand	0.02	.... 0.06

The difference, continues the Professor, between these substances is very considerable, and much in favour of the tares, which contain more than twice as much albuminous compounds, and considerably more starch and sugar, than the peas brock. The latter, moreover, contains a very large quantity of fibre, which may be said to be valueless as far as feeding is concerned.

If we calculate from the relative quantities of albuminous compounds and starch in the two, and if tares



E. H. H. H.

Harry Hill, Newmarket.

Albion
 A magnificent specimen of the English breed of horses, bred at Newmarket, and owned by the late Duke of Devonshire.

be assumed to cost £7, the peas brock should not be sold at more than about £5 per ton.

"I may observe," says Dr. Anderson, in the valuable paper from which I have taken so much, "that most kinds of refuse matters produced in manufacturing operations are sold at prices considerably higher than their quality justifies. This remark, however, is perhaps less applicable to such substances as can be applied to the feeding of stock than to those which are sold as manures. Refuse lime for instance, often in a very moist state, is frequently sold at a price higher than that at which quick-lime can be got direct from the kiln; and the value of the refuse of the comb-makers and bone-turners is often over-rated. This is not because they are not possessed of a definite value, but because being refuse in the manufactories in which they are produced they are not preserved with any care, but become mixed with rubbish of all kinds and in large quantity, and hence a purchaser who pays a price which might be moderate if the substances were pure, is made to give a full price for a mixture of inferior value. Of course this does not occur to the same extent in the case of mill refuse, which is commonly kept clean and pure, but nevertheless the price asked is generally too high."

The quality of oilcakes and their most profitable employment, is a very important inquiry; and here Professor Voelcker (*Jour. Roy. Ag. Soc.*, vol. xxiv., p. 592), has lately directed our attention to the varying composition of cotton cake as met with in commerce. As he observed, cotton seed has a hard shell, which in some varieties amounts to one-half the weight. The best cake is made from the kernel only; but this is not met with in England, but the ordinary cotton cake is made from the whole seed. In this whole-seed cotton-cake there is sometimes such an excess of husk or indigestible cotton-fibre present, that the animal which is fed upon it has not the power to deject it; a mechanical stoppage takes place in the lower intestines, inflammation of the whole intestinal canal ensues, and the animal dies. There is indeed a great danger in giving the whole cake made of the seed indiscriminately, that is to say, in too large a proportion; it ought always to be given in the form of meal, together with roots or other succulent food which have a tendency to keep the bowels open. "During the last year or two" adds the Professor, "I must have had a dozen or two of so-called poisoning cases arising from the use of cotton seed cake referred to me; but in no case could I detect any poison. In one particular case I found a large mass formed, as hard as a cricket-ball, in the lower intestines, evidently causing a mechanical stoppage that resulted in inflammation of the stomach."

It is pretty certain that the oil of the linseed cake by its relaxing properties acts very usefully in preventing those obstructions sometimes caused by the use of cotton cake. It has been commonly found that cotton cake answers better for sheep than for cattle. It is, in fact, of the greatest importance that we should "gang warily" with cotton cake, for it is now supplied to us in largely increasing amounts, and at a much lower rate than linseed cake. I am informed by an eminent firm in the oilcake trade, the Messrs. Wheeler and Sons, of Mark-lane, that there is an expected import of cotton seed from Egypt in 1864, of about 80,000 tons. In 1863, the 96,000 tons of oilcakes imported according to their calculation, consisted of

Cotton seed cake, about.....	10,000 tons.
Rapeseed cake.....	10,000 "
Linseed cake.....	65,000 "
Various other kinds.....	10,000 "

The chemical composition of cotton cake does not vary very considerably from that of linseed and rape cakes. A specimen of each kind analyzed by Dr. Anderson, contained per cent.:

	Linseed.	Rape.	Cotton.
Water	12.44	10.68	11.19
Oil	12.79	11.10	9.06
Albuminous compounds.....	27.69	29.53	25.16
Ash	6.13	7.79	5.64
Other constituents.....	40.95	40.90	48.93
	100.00	100.00	100.00
Nitrogen	4.33	4.38	3.96
Phosphates	2.73	3.87	2.19
Phosphoric acid.....	0.55	0.39	0.15
Silica	1.05	1.18	1.32

It is probably by the nature of the oils existing in these cakes that we must account for their differing operation upon our live stock; that of linseed, for instance, possessing aperient properties; that of cotton being inert, and so nearly tasteless, that it is exported from this country in considerable quantities to the olive-oil-producing districts.

When we are judging of the real value of the different oilcakes now so essential to the farmer, the degree of their purity is, of course, a very primary consideration. Now, to this very valuable inquiry Professor Voelcker not long since directed his attention. It was when addressing the Council of the Royal Agricultural Society on the "Adulteration of Linseed," that he observed (*Jour. Roy. Ag. Soc.*, vol. xxiv., p. 590):

"I have examined many specimens of linseed from various quarters. Bombay linseed, in one sample, gives 4½ per cent. of impurities; the finest Bombay that ever came under my notice contained 1½ or barely 2 per cent. Black Sea linseed, 20 per cent.; a second sample, 12 per cent. Odessa linseed, 12½ per cent.; medium Riga seed, 35 per cent.; Morahanski linseed, 7 per cent. Fine Black Sea, imported December, 1861, and sold as fine Black Sea, 19 per cent. Another sample, landed in 1862, and considered of good average quality, also contained 19 per cent. Fine Petersburg, 3 per cent.; Petersburg Rijeff (common), 41 per cent.; a second quality 43½ per cent. Riga crushing, consisting of average quality, and shipped from that port, 49½ per cent.; another sample, imported 1862, 42 per cent. Petersburg Rijeff (common), of which a large quantity finds its way to Hull and other ports, 70 per cent. So that there are actually samples of linseed sold which contain only 30 per cent. of pure linseed and 70 per cent. of impurities. These are samples taken indiscriminately. The fact is, that the seed frequently gets adulterated before it is landed in England. As soon as it reaches the hands of the Greek merchants it undergoes the adulterating process. Fine samples are made and sold to a few firms that make pure linseed cake, and have good customers who can afford to pay a proper price. The impurities are sifted out and made into second, third, and fourth qualities, which then are sold under various names.

"Now, if the seeds that occur in linseed were all of an indifferent quality, that is to say of a character not injurious to life, the injury would not be so great; but some of them are poisonous. From several samples of linseed I have separated the seeds and ascertained their botanical characters. In one particular sample I counted not less than 29 different kinds of weed-seeds, and among them the following which are more or less injurious: The common dandelion, which is frequently present in considerable quantities in the inferior samples of Petersburg seed; corn-sockle, which often produces very serious effects on the animal system; wild radish, which occurs in some samples of Alexandrian seeds, and is very pungent; wild rape, which is not, properly speaking, a rape, but rather a mustard; charlock, or the common wild mustard. All these are seeds which it is positively known are injurious to the health of animals.

But there are others which, as I stated at the beginning, impart a disagreeable taste to the meat of cattle fed upon inferior cakes. The Gold of Pleasure, or *Camelina sativa*, is such a seed, giving a disagreeable taste and also a deep yellow colour to the fat of animals. From the appearance of *Camelina* cake you would think it ought to be nutritious; but it is an inferior description of cake, because it deteriorates the quality of the meat. Another seed of an injurious character is the purging flax.

"Now, a good and genuine linseed cake ought to have a bright colour, and when mixed with water ought to form a thick, agreeable-tasting, and pleasant-smelling jelly; but a very disagreeable smell is developed, if you mix with water an inferior cake, like that of a cage in which you keep canary-birds. This is due to the impurities of the seeds. Among others, the common spurry and hempseed, which occur in very inferior cake, impart a very disagreeable taste. You may readily test this by the taste and the smell. When linseed cake has been kept for a length of time, its mucilaginous properties more or less disappear. Mucilage is a substance that is very apt to spoil when kept in a damp place. If a cake does not become gelatinous on being mixed with water, it is not one of the best descriptions; but then the reverse does not follow as a matter of course. A cake may become gelatinous, and yet be inferior. Wild mustard and rapeseed very commonly occur in inferior linseed; when such cakes are mixed with water a more or less pungent smell of mustard is developed. I may observe, in passing, that rapeseed ought always to be tested in this manner; for rapeseed, especially that which is sold as Indian seed, very generally contains a large amount of mustard seeds, and becomes so pungent that it is extremely injurious to cattle. I have here a sample of a cake sent to me for examination not long ago, which had killed three oxen. It is a rapeseed of the description just named—Indian rapeseed containing a good deal of wild mustard."

The condition of the cake, its freedom from mouldiness, is also a most important consideration. At the same lecture Professor Voelcker produced a sample of what he well described as a very strange mixture which had been imported at a low price by a gentleman who thought of giving it to his cattle. "It is composed of the sweepings of an oil-mill and the warehouse of a general provision dealer. Having carefully separated its various constituents, seeds, and bits of oilcake, I could not find anything injurious; but under the microscope I discovered the germs of fungi, which have since developed so plainly as to be seen by the naked eye. The sample I now produce has killed not less than fourteen sheep, three horses, and a pony, belonging to this gentleman, who gave them only in a small quantity. The whole of the animals were killed within two days."

Certain aromatic condiments, as mixtures with the food we feed with, have perhaps hardly been well employed. It is now some time since Mr. J. B. Lawes, when remarking upon different advertised cattle food, observed (*ibid.*, vol. xix., p. 199). "These frequently cost from 40s. to 50s. per cwt. Taking, for those for which it is given, the published average prices for the six weeks ending July 17th, 1 cwt. of the following stock foods would cost as under:

	s.	d.
1 cwt. barley	8	4
" oats	9	2
" beans	9	4
" peas	9	6
" lentils	10	0
" oilcake	10	0
" linseed	16	6
" hay	4	0

The manufactured foods thus cost, weight for weight, four or five times as much as the most nutritive of the ordinary stock foods on our farms. (Of course the relation will vary with the market prices; but the prices *per cwt.* can at any time be easily calculated for the purpose of comparison).

"The following is the result of an analysis in the Rothamsted laboratory, by Mr. Segelcke, of one of these foods.

Water	12.86
Nitrogenous substance ...	15.51*
Fatty matter	6.22
Starch, sugar, &c.	55.97
Woody fibre.....	5.50
Mineral matter.....	3.94
	100.00

* Nitrogen 2.45 per cent.

"Independently of the slight colouring with turmeric, and flavouring with cumin, anise, or other of the stimulating and carminative seeds used in cattle medicine, which these foods frequently exhibit, the constituents as here stated, could be supplied by a mixture of barley-meal with some of the leguminous seeds enumerated, and oilcake or linseed. Such a mixture, according to the prices quoted, could be prepared for about one-fourth the price of the manufactured cattle-food.

"These foods are recommended to be used in comparatively small proportion to the total food consumed. The animals have, therefore, still to rely for the bulk of their nourishment upon ordinary food; and it is stated that, with the use of these manufactured foods, the quantity of corn may be reduced to about one-half; and that coarse and comparatively innutritious matters, such as bran and chopped straw, will, by the admixture, be rendered palatable and nutritious.

"Now, bran and chopped straw contain a large proportion of woody fibre; which, though required for bulk by the ruminant animals, passes through their bodies in a finely-divided state, but otherwise almost unchanged. More or less of the soluble matters are extracted from such food during its passage; but no evidence has been brought forward to show that these manufactured foods will so stimulate digestion, as either to extract more of its already-existing nutritious matters, or to render the woody fibre itself, of the coarse food mentioned, more directly serviceable to the nourishment of the animals.

"All animals require in their daily food a given amount of digestible and convertible constituents; such as starch, sugar, pectine, gum, oil, nitrogenous compounds, and certain mineral matters. The proper amount of some or all of these *must* be contained in the food supplied; and no stimulant, or any other device, can substitute that necessary amount, if the animal is not to decrease in weight. If, on the other hand, the animal be required to increase in weight, as in the case of our growing and feeding stock, an additional amount of digestible and assimilable constituents is required, beyond that which, under otherwise equal circumstances, would keep the animal at a fixed weight. In fact, no stimulus whatever can substitute the supply of the digestible and assimilable constituents in the food, whether it be required for the purposes of labour, or of increase in weight. In other words, the waste of matter in the body by respiration and perspiration, the loss by urine and faeces, and the gain in weight of fat, flesh, bone, &c., must all come from constituents *actually contained in the food.*"

The much mooted question of feeding stock on malt did not escape the attention of Professor Voelcker, as he remarked (*ibid.*, vol. xxiv., p. 596): "At present our practical experience of the feeding properties of malt is

very inconclusive. The feeders of stock speak very highly of malt. When an animal has to be got into fine condition, and supplied with a large amount of food in order to its rapid development, the addition of malt is most useful. It seems to help the digestion remarkably. Now, we can easily understand this. For in malt not only the ready-formed sugar acts usefully, but there is also a peculiar power of changing the starch in barley-meal rapidly into sugar. This accounts for the efficacy of malt in certain circumstances. When cattle are highly-fed, I believe the addition of malted barley may prove of great utility.

"Another question of great practical importance is, whether by the addition of malt other food which is objectionable to a certain extent, on account of its indigestibility, may not be rendered more available for feeding purposes. On the whole, I think the fattener of stock might find some valuable ends answered by the use of malt; and although I cannot, from our present stock of knowledge on the subject, say whether it would be desirable to replace barley-meal by malt, I have no hesitation in saying that in certain instances the liberty of manufacturing barley into malt would be a great boon to the agricultural community."

At a time when the Chancellor of the Exchequer is proposing to allow the farmer to malt barley for the use of his live stock, these cautious opinions will be entitled to great weight. The evidence of many practical farmers, which will be found in a subsequent page of this magazine, all lead to the conclusion that, the use of untaxed malt will be a great boon to the stock-owner (See debate at Central Farmers' Club, post p. 229).

It is true that certain experimental enquiries carried on some years since by Dr. T. and Dr. R. D. Thomson did not tend to prove the truth of this assumption; but still we are all aware how advantageous to the health of our stock is change of food, even if the same food is given to them merely in a different form. The report of the researches of these two chemists, was printed by order of the House of Commons, and from that paper we learn (*Parl. paper*, p. 4), that although malt has never been hitherto much employed in England for live stock, yet that a little malt is often given in Scotland to horses, for the purpose of giving them a smooth skin, but that this *must not be kiln-dried*, for it then proves injurious to the animal. Dr. Lyon Playfair says, "a given weight of barley is of greater nutritious value, both as regards the production of muscle and fat, than the same weight converted into malt" (*ibid*, p. 6). Dr. Graham adds, "In Germany, where the manufacture and use of malt are subject to no restrictions, it is not employed for fattening cattle, as I have been assured by Professor Liebig" (*ibid*, p. 7). The effect of the process of malting was examined by Dr. Thomson (*ibid*, p. 87). Equal measures of barley and malt were proved to weigh 424 and 325. According to these returns: 1, A bushel of barley of 55lbs. becomes when malted from

43 to 45lbs. 2, A bushel of barley of 55lbs., becomes 43lbs. when malted. The mean of these returns indicates a loss of 19 per cent. in weight, or nearly 1-5th. The whole of this loss, however, is not solid matter; for barley, when not crushed, contains 13.1 per cent. of water, and malt in the same condition but 7.06 per cent., only 6 per cent. therefore is solid loss. The loss of 19 per cent. sustained by barley in malting may be stated as follows:

Water	6.00
Saline matter	0.48
Organic matter	12.52

Previous to the trial of the effects produced upon the butter and milk of two heifers intended to be fed with barley, malt, and rye-grass (*Lolium perenne*), these substances were analysed by Dr. Thomson; he found in 100 parts of each dried in a temperature of 212°—

	Grass.	Barley.	Malt.
Carbon	45.41	46.11	43.93
Hydrogen	5.93	6.65	7.00
Azote	1.84	1.91	1.50
Oxygen	39.21	42.24	46.30
Ash.....	7.61	3.09	1.27

100 parts of the ashes of the malt were found to contain:

Silica	28.74
Phosphoric acid	38.34
Chlorine	a trace
Peroxide of iron.....	1.59
Lime	3.82
Magnesia	9.82
Potash.....	11.70
Soda.....	5.99

Dr. Thomson then proceeds to calculate the nutritive powers of barley, which he concludes are superior to those of malt. "If we estimate," he says (*ibid*, p. 84), "the albuminous principles of grain to contain 16 per cent. of nitrogen, then the amount of these substances in the barley examined will amount to 12.56 per cent., while the per-centage of these principles in the malt will only be, by the lowest estimate of nitrogen, 7.43, and by the highest result it will be 10; so that the relative nutritive powers of barley and malt, according to these estimates, will be:

59 barley = 100 malt according to lowest estimate.
79 barley = 100 malt according to highest estimate."

These facts are well worthy of our careful attention. We shall, I trust, now have soon placed in our power the untaxed use of malt for our live stock. It will be then speedily determined by many a carefully conducted experiment, to what extent it can in this way be profitably employed. If, as there is great reason to believe, its value is considerable, there will be afforded to the opponents of the malt-tax a very strong argument for the abolition of the impost.

THE KILLERBY, STUDLEY, AND WARLABY HERDS OF BOOTH CATTLE.

SIR,—Nothing has given me greater pleasure than to hear that an attempt is about to be made to do justice to a subject of national importance by describing the rise, progress, and present excellence of the Booth cattle, and the career as breeders of that well-known family which has given these cattle their celebrity and their name. The public will, I am sure, make every allowance for the difficulties of a task which commences with an account of what took place at a time beyond the memory of living men, and which embraces such a very extensive field of

labour. But, at the same time, it must be a cause of no little gratulation that the task has devolved on one who is in every respect so successful a breeder himself, so well acquainted with the Booth family, and so capable of directing attention to those circumstances which are most interesting and improving to the public; I mean Mr. Carr, of Stackhouse. At his request I have undertaken to introduce the subject in a few prefatory remarks, which I now offer to your favourable consideration.

If, Sir, the ancients had been told that in the later ages

of the world, far away in the then most barbarous of Western Isles, men would suddenly arise—men who were neither kings, philosophers, nor statesmen, but mere tillers of the soil, yet men endowed with the power and the skill for the first time to discover how man could mould and change the beast of the field so as more completely to promote his views and enable him to gain a wider rule over animated nature; if they had been told that these men would find their flocks and herds gaunt, unshapely, and unthrifty, such as other ages had known them, such as they are depicted on the walls of Nineveh, or portrayed in the sepulchres of the Pharaohs, and that they would modify, change, reproduce them, till they became elegant, attractive, shapely as the antelope or the deer, yet with their value to man doubled, trebled, quadrupled; and if they had been further told that these beautiful creatures, so improved, so altered by the hand of man, would be sought after by people of the most distant lands and the furthest climes—that ancient lands would procure them at the greatest cost, that new countries far beyond the setting sun would purchase for fabulous sums of gold these valuable treasures—if, indeed, the ancients had been told this, surely they could never have believed that it was possible for man to accomplish such a change. But if they had believed it, what honours would they have considered too great, what rewards too precious for such wonderful benefactors of the human species?

And yet England, the land where these wonders have been wrought, has been to a great extent insensible to the merits of these men, and to the value of their discoveries. Though fully sensible of the value of the discoveries made by the great pioneers of scientific improvement, the Arkwrights, the Watts, and the Stephenson, she has not been so fully alive to the value of those as important discoveries made by their contemporaries, the Bakewells, the Collings, or the Booths, who were engaged in elucidating a page in Nature's Book equally valuable to man. Nay, she has actually charged them and their fellows with not keeping up with the progress of the period; as if the moulding of animate nature to man's wants and will was not as noble and beneficial an exercise of the human intellect as it is to mould and subjugate the inanimate! Perhaps the modest stillness of these men's lives, while each in his own sphere pursued his noble task, caused their beneficial labours to be less known and less appreciated; but the time will come—nay, it has already dawned—when the value of those labours to the human race must be recognised and understood.

Foremost of these men was Robert Bakewell. Born in 1728, and dying in 1795, he was a contemporary of Arkwright through the latter's whole career. To him it was first given to make the grand discovery that Providence had permitted man, not only to subjugate the animal creation to his will, but also so to modify and alter the structure and conformation of the animal itself, that it might be made the more capable of ministering to his wants. The animal on which Bakewell first tried his improving hand was the sheep; and, by a careful study of Nature's laws of reproduction, and a studious selection of the best animals within his reach, he succeeded, after the labour of many years, in producing a new and improved breed, the New Leicester, the great excellence of which soon secured it wide and universal approbation. He next carried out the same principles of improvement with regard to cattle; and what those principles were will be more fully seen in the ensuing letters, for the true principles of breeding are and ever must be as immutable as the laws of nature on which they depend. Here, too, he was in a great degree successful; and if he was not so pre-eminently successful as he was with regard to sheep, and if his Improved Longhorns have not permanently established themselves as a prevailing breed, it is because he had met in the Craven

cattle such good material to work upon as his successors had in the Teeswater, and the Longhorns have therefore given way to the superior merit of the Improved Shorthorn.

Contemporaries of Robert Bakewell in the later period of his career, and imitators of his principles and success, were the two brothers, Charles Colling of Ketton and Robert Colling of Barmpton, both in the county of Durham, and both within a few miles of Darlington, which may be said to be the metropolis of the Improved Shorthorn, or, as they have been sometimes called, the Durhams. Of these Improved Shorthorns the brothers Colling were the first originators, commencing their improvements by the purchase of the now celebrated bull Hubback, about the year 1780. From their blood all improved shorthorns of the present day more or less derive, and many and eminent are the names of those who, imitating their success, and availing themselves of their cattle, have contributed to spread the fame of the shorthorn through this and other lands.

With these, however, we have no immediate concern. It is our present object rather to trace the progress made in this direction by the late Mr. Thos. Booth of Killerby and Warlaby and his sons; a history intimately interwoven with and inseparable from the history of the Shorthorn breed itself. For Mr. Thos. Booth was no servile imitator. He was a contemporary of the Collings, and began his career quite independently of them, as an improver of the cattle of the same district, and he commenced it nearly at the same time. Mr. Booth had been a breeder of shorthorns many years when the celebrated Durham ox, bred by Mr. Charles Colling, was first exhibited throughout the kingdom, and drew universal attention to the shorthorns. He afterwards did what wisdom dictated, availed himself of the Collings' best blood, and incorporated it with his own; while his sons at Killerby, at Studley, and at Warlaby, have continued the same herd down to the present time, and given it a world-wide fame. The present Mr. Richard Booth of Warlaby is a grand connecting link between the present and the past. Himself the heir and the representative of one of the earliest improvers, he retains in his herd his father's blood, while his own skill and success as a breeder of cattle have been so superlatively great, that it is not too much to say that he has arrived at such distinction in this line as was never before attained by any individual in any country or in any age.

Before, however, we enter upon the description of the Booth herds, it may be interesting to inquire—What was the origin of the cattle which, in the hands of the Collings, the Booths, and others, have been the instruments of improving the herds of so many distant countries, and of adding so largely to the food of man? It will be seen in the following letters that the cattle of the valley of the Tees, technically known as the Teeswater, were the origin of the improved race; while to this may be added, that a kindred race in a neighbouring part of Yorkshire called Holderness, and known from that circumstance as the Holderness or Yorkshire cow, was evidently derived originally from the same source as the Teeswater, and shared with them in the general improvement. The original character of the Teeswater cattle, and how they were modified and improved, will also be enlarged upon in the following letters. But the further question arises: From what source did the Teeswater themselves spring? It seems that this question admits of one answer only. They sprang from the aboriginal wild cattle of this island. Naturalists seem to admit that in the remains of the wild cattle still in existence the differences of structure are so slight as to render it by no means improbable that the various breeds of domestic cattle now inhabiting this island are all of them mere varieties of that species which once roamed wild and undisturbed through its forests.

But if such is the probability with regard to all our domestic breeds of cattle, the probability that the Teeswater, the origin of the Shorthorn, was so derived is infinitely greater. The wild cattle had been retained to a time little beyond the memory of man, in seven or eight noblemen and gentlemen's parks, in all their pristine wildness, utterly reclaimed, and in a few of these they even still exist. It is impossible to examine these, and compare them with our domestic cattle, without at once perceiving that their character is that of the Shorthorn rather than of any other breed. Without insisting too much on colour, which is apt to be influenced much by man's cultivation and care, yet even this head presents us with one remarkable feature: it is in the Shorthorn principally that the aboriginal colour of the wild cattle—white—is disposed to crop out and reappear.

But a still more remarkable circumstance remains to be mentioned. The Valley of the Tees was the head quarters and central habitat of the domestic race from which the Shorthorn sprang. It appears to have been also the very heart of the domain of the original wild race. At least it is very remarkable that Chartley Castle and Lyme Hall, in Cheshire, the most southerly points where the wild cattle have been preserved till recent times, are about 120 miles distant from the Tees in one direction, while in the opposite direction from that river, Hamilton and Drumlaing at a similar distance are the extreme points at which they have been retained towards the north. But more; they surrounded within a much smaller radius the Valley of the Tees itself; Gisburn in Craven, and Burton Constable, in Holderness, retained them not long since, and Chillingham Castle, in Northumberland, has these wild cattle still, while so recently as 1685 they existed at Bishop's Auckland almost in the Valley of the Tees itself.

No other breed but the Shorthorn can establish such a claim to descent from the wild cattle. Nor is it a mere fanciful investigation, but one bearing considerably on several important matters in breeding. It bears in no

remote degree upon the disputed question of in-and-in breeding, and seems to show that, under certain circumstances at least, breeding from very near affinities may be pursued without creating deterioration. The wild cattle at Chillingham were once reduced, by an epidemic, to one cow in calf; the produce was a bull, and from these two have descended, without the infusion of any fresh blood, the whole of the present herd.

Another conclusion will be drawn from this investigation by the intelligent breeder. It is this, that the Shorthorns, more than any other cattle, will be liable to reproduce the colour of their wild progenitors, to give birth to white calves.

Another practical conclusion still remains. The wild cattle in different localities seem to have differed from each other in some important particulars. Those at Gisburn were hornless, and it is said that at Hamilton the females are generally polled; those at Burton Constable had black ears, while the Chillingham wild cattle have red. But in one respect they all seem to have been alike; they are all said to have had *black noses*. And it is a remarkable circumstance that, as will further appear in these letters, so in general had the Teeswater, the parent of the Shorthorn. The idea, therefore, that a stained nose necessarily shows impurity of blood, is a popular but an erroneous superstition; and I shall be glad if I have been able to remove the incubus which weighs on many a good man's mind when it appears, as it undoubtedly will occasionally, in his herd. It is the mark of the wild progenitor, removed by man's care, but in spite of it reappearing.

"*Naturam expelles faréa, tamen usque recurret.*"

Having trespassed upon your valuable space for these few introductory remarks, I leave Mr. Carr to pursue his interesting and important work; and

I have the honour to be, sir, your obedient servant,

Heltham, Feb. 18th.

JOHN STORER.

THE FARMER WITH AMPLE MEANS.

I am not going to show that every farmer with ample means does succeed: I know many unfortunate cases to the contrary. One, in particular, presents itself to me. A fine, spirited fellow, with ample means, took a large farm (700 acres) in a southern county. The farm was a good deal out of condition; but the rent and covenants were liberal, and extended over a term of seven, fourteen, or twenty-one years, at the option of the tenant. The landlord was a needy man, and very dilatory in completing the repairs as stipulated. This led to altercations, ending in the tenant's completing them himself, under arrangement. For the first two or three years the management was liberal, the returns fair; but ultimately, owing partly to the continuous strife and vexatious conduct of the landlord, and the unpleasant and difficult position in which the tenant found himself, a distaste for business arose, everything went wrong, and in the course of a very few years he quitted his occupation, minus a good many thousand pounds. Another instance I would name. A farmer, with ample means, took a small farm (200 acres) in a western county. The farm—an average light-land farm—was in superior condition. The whole of the business was exceedingly well managed, and everything was made the best of. The accounts were kept in beautiful order and correctness; but, owing to unfavourable seasons and depreciated times, the tenant could not keep his own. He therefore preferred, after a few years,

to relinquish it, and live upon his capital. This is an instance of a farmer with ample means, judiciously expended, failing success, owing to adverse times and seasons. It is certainly an exception; but who can stand against those combined circumstances for any lengthened period? It must, of course, be borne in mind that farmers, of all others, are more subject to those vicissitudes over which they have no control than any other class, be their judgment ever so perfect.

The Farmer with Ample Means.—I am well aware that any attempt to sketch a course of management for any particular farm, is open to many valid objections, as farms differ so much in soil, situation, and climate. However, one good general view of such a course must be taken, with such limitations and such extensions as may respectively present themselves to farmers as being adapted to their respective farms.

I shall take a farm of average extent, in a good loamy district—say 400 acres, one-third thereof being pasture-land. The tenant to be without restrictions as to management or cropping, but on no account to break up the grass-land. The farm is taken, the tenant-right paid, the entry Lady-day. One of the first considerations with the new tenant will be as to the best course for stocking the farm and providing proper implements. In the latter particular, he will weigh anxiously and carefully the question of steam cultivation. Is it best to expend my capital

in steam-cultivating implements and machinery, or in cart-horses and ploughs? A steam-engine is indispensable for thrashing, grinding, and cutting: the difference lies between the implements of culture and cart-horses and ploughs only—other implements will alike be required upon either system. I therefore put the steam-engine out of the question. Take eight cart-horses and harness, value £260, and four ploughs, value £16, total £276; steam-cultivating implements, with 1,600 yards of wire rope, &c., &c., price £250: therefore, being nearly equal in price, he adopts steam cultivation, and saves the keep of horses. His other implements and machinery he buys of the best makers, and of the most approved kinds. His stock he will do well to buy of those peculiar breeds most popular in the district. It is not always wise to depart from such a rule, even if the stock is somewhat inferior. There may be some good reason why they are there located. His experience will soon open his way to improvements in this respect. The cart-horses and carriages will require consideration. As the horses are kept chiefly for cartage, he will adopt carts in preference to waggons. Thus he will save in carriages. As nearly all his heavy culture will be done by steam-power, his horses are only required to do the lighter portions of work, such as the harrowing, rolling, drilling, horse-hoeing, &c.; he will consequently require but a limited number; but as his means are ample, and he hopes to make deviations in culture and management, he will keep a sufficient horse-power, and therefore will purchase eight horses, so that the actual cultivating force upon the farm will be a ten-horse steam-engine and eight cart-horses; but as the steam-horse does not tire, but the more you feed him, the more work he will do, he might be estimated at sixteen horse-power, which will give ample force to work the farm up to the highest style of culture and management.

We now come to actual process. At Lady-day (the time of entry), we take it that all the corn-crops are sown and growing up. The business of the farm, then, will for a time be cultivation solely. The steam-cultivator is most effectively working the fallows, followed by the teams with harrows and rollers when requisite. The land is rapidly pulverized by repeated stirrings at a satisfactory depth, and so worked that it is in a state ready for manuring and sowing for the winter food crop. The time and season are patiently waited for, when all should be got in as speedily as possible, and generally ought to be upon the ridge system, the steam plough, under arrangement, performing the ridging work, the teams leading on the manure. Should it be necessary to put a fallow crop in upon the flat, the steam plough is still more effective. The chief advantage in the ridge system is the facility it gives for beneficial horse-hoeing.

I pass over the first summer's farm-work with the remark that a judicious farmer, with ample means, will attend closely to every detail in management, so as to

prepare his farm for any order of culture and cropping he may see it right to adopt. In the autumn he finds himself at liberty to make his choice. He has about 270 acres of arable land to appropriate. His first course of cropping should be something like this—*i. e.*, 90 acres of wheat, 80 acres of oats, 30 acres beans or peas, 30 acres of barley (providing the outgoing tenant has not left this breadth in seeds or clover), 30 acres of potatoes, 10 acres agricultural seeds—*i. e.*, turnip-seeds or rape—20 acres mangolds, 20 acres swedes, 10 acres of turnips or cole-seed: total, 270 acres. In the future ordering of his course of cropping he must decide according to the cleanliness and condition of his land. No fear need be entertained of a *judicious farmer, with ample means*, being unable to keep his farm up to the mark in cleanliness and fertility; there are so many exceedingly good artificial manures to be purchased, besides the use of abundance of artificial foods for stock, in the course of the consumption of the straw of the farm, and making it into manure. The farmer I now speak of, being a man of business, *ample means*, and correct judgment, is sure to adopt this liberal management. There is no other good course for him. This being the case, such a man must not be restricted in his order of cropping. Hence, he may deviate according to circumstances, and just take such crops as his land can be prepared for, or be made by one means or other to yield. If he can get it to be so fertile, and in such high condition, as to bring alternate crops of wheat and potatoes, there can be no good reason to prohibit him; or if he can produce good crops of agricultural seeds—*i. e.*, turnip seeds, mangold seeds, rape seeds, or mustard seeds, or if it would answer occasionally to grow crops of flax, hemp, chicory, liquorice, garden seeds, or similar produce, there can be no real ground of objection. No soil will profitably produce these varieties of crops, unless specially prepared or in high natural fertility. It may be said that none but good loamy soils can sustain such heavy courses of cropping. I am by no means sure of this. One thing, however, is certain: no one knows the limits of production in any soil, under the best modern courses of culture, and under the most liberal and scientific manurings. The most barren soils, under appropriate manurings, yield good crops. What, then may be anticipated of good average farms? If the restrictions of the last century are to be upheld, of what value are modern improvements? On the contrary, every inducement and facility should be held out to a judicious farmer, in order to stimulate him in his management, and in the liberal outlay of his capital to promote the successful cultivation of his farm. This is the way, the only true way, whereby a good farmer is sure to succeed in average times and seasons; and my impression is that ultimately, as agricultural knowledge extends, and these modern improvements become general, the agriculture of this country will be in a position to compete favourably with all the nations upon earth.

THE CULTIVATION OF TOBACCO.

An effort is being made to induce the Government to make such an alteration in the duty on tobacco, so as to admit of its cultivation upon an extended scale in the United Kingdom, and especially in Ireland, where, it is assumed, both soil and climate are adapted to the plant. The enormous consumption that this weed has now attained with us, would make it almost a crime in the Government to prohibit its culture, or to throw obstacles in the way, could it be shown that it would, in the long run, be beneficial to

the agriculturists. Upon a reference to the returns of the Board of Trade, we find the following are the amounts of tobacco annually imported at four periods from 1851, with the duty paid thereon:

Year.	Lbs.	Duty.
1851.	28,062,841	£4,309,426
1856.	88,803,500	5,070,375
1861.	84,976,438	5,246,668
1863.	85,514,985	5,327,247

Independent of this enormous amount it is estimated that the supply smuggled into the country or made from other substances than tobacco, is fully equal to one-third of what is imported, and consequently that nearly fifty million pounds are consumed in the country. Supposing this to sell at one shilling per pound in the unmanufactured state as delivered by the growers, it would return two millions and a-half sterling, which, if the cultivation could be proved to be profitable, might as well be paid to the British farmer as to the foreigner. There are, however, many important considerations to be disposed of before such a result can be established; and it is with the view of pointing these out that we refer to the subject.

Tobacco is a plant that requires a rich, deep soil, and a large allowance of manure. On the other hand, it returns nothing to the soil; so that if the process of growing be repeated and a sufficient quantity of manure is not added to it, the land will soon be impoverished. This will be understood by the scientific farmer when we state that the ashes of the leaves of Hungarian tobacco range from 18.9 to 24.2 per cent., and of the stems from 22.9 to 27.36 per cent., both having previously been airdried. Now the ashes, it is well known, are all mineral or inorganic elements, and that unless replaced by manure are wholly lost to the soil. This will account for the exhaustion of the lands in Virginia, where thousands of acres have been abandoned that once produced large crops of tobacco, but are now completely barren. This is of less consequence in a new country, with a scanty population like the United States, where there is plenty of fresh land to fall back upon as the first cultivated becomes unprofitable. But it would be a serious matter for the British farmer who should go into the cultivation to find that he must either rob his other land of its share of manure, or buy large quantities of artificial manure, or inevitably impoverish his farm. This is no fancied theory, but the actual state of the case, and our farmers will do well to make further enquiry before they commit themselves to it.

But another question arises of equal, and even more, importance, because upon it depends the success of the speculation. Can we, then, produce tobacco of a quality equal to the foreign, so as to obtain a good price and sale for it in the market in competition with the foreign grower? We believe not; and the reason for this opinion is, that we have conversed with persons who cultivated it formerly in Ireland upon a considerable scale, until the Government officials interfered and put a stop to the practice. One large grower assured us that, although the first year he sold it readily, he could not dispose of it at all in the two succeeding years to the manufacturers; in fact, that it was only fit for gardeners to fumigate their plants and shrubs, or for dressing sheep to destroy the tick. The reason was, that it contained so large a proportion of *nicotine*, which is a volatile oil highly poisonous, that the flavour was too pungent. Had not, therefore, the Excise interfered, he would have abandoned the cultivation as in every way unprofitable, injurious to the soil, and unsaleable when grown.

But there are other considerations equally powerful, and even more so, that render it almost an impossibility for the British farmer to cultivate tobacco to advantage. Such is the nature of the plant, the processes it has to undergo, the extent of bright sunny weather required to bring it to perfection, to cure it, and prepare it for sale, that in our cli-

mate they amount of themselves to a prohibition without legislative enactments. Not one season in three in this country would give the required amount of sunshine necessary for the perfect growth and preparation of tobacco. With regard to the mode of cultivation, the following description of the processes adopted in America will give the English reader an idea of the trouble and risk attending it. A rich light loamy soil is required, full of manure, and properly tilled and pulverized. The plants are raised first in a hot-bed, about the beginning of March, and in May are transplanted singly, allowing three yards square to each plant, so that there are 1,618 plants on an acre. The progress of the plant must be well watched, to destroy the caterpillars and other insects that are sure to attack it. When it has thrown out twelve leaves, it is topped, to check further growth upwards, and all flower-buds removed to give greater development to the leaves. About the beginning of September the crop will be ready for harvesting.

Thus far, the process, though troublesome, requires only diligence and attention; but now the difficulties begin. The leaves are gathered and hung in covered sheds for six or seven weeks to dry. Some growers lay them in heaps to sweat them before hanging them up, which facilitates the drying, and improves the flavour of the tobacco. When dried they are again thrown into heaps on the floor, and covered with mats to promote fermentation, which gives fragrance to the "weed." If the weather is damp this process will be completed in thirty-six hours or a little more, and it must be stopped on arriving at a certain degree of heat, ascertained by pushing the hand into the mass. When this is obtained the mats are taken off, and the leaves spread out and repeatedly turned over. If the fermentation is either too great or too little, the quality of the tobacco is injured. After this the leaves are laid flat on each other in heaps, and repeatedly turned over and manipulated until they assume that tough leathery texture and appearance we observe in it when imported. When this is completed it is either twisted into rolls, made into bales, or packed in hogheads with a powerful lever, which diffuses the oil they contain throughout the mass. Many of these processes must be conducted in open sheds, and all require hot weather and bright sunshine. A cold damp atmosphere, such as is frequent in the United Kingdom, and especially in Ireland, would be fatal to the success of the harvest. This is also the case while the plant is growing, and the quality of the product depends much on the amount of bright sunny weather it enjoys during the latter part of its growth. The absence of sun renders the produce so acrid, and even poisonous, that it will only avail, like that grown in Ireland, for fumigation.

With such trouble and risk, the reader will judge whether it will answer his purpose to undertake the cultivation. One of the gentlemen already referred to as having formerly entered upon the cultivation in Ireland, told us that if the Government would have allowed of its being grown *free of duty*, it would have paid him amply at 1s. per pound. But such was the quality of the produce, that he was glad eventually to sell his two years' stock at 8d. or 4d. per pound to a manufacturer, who candidly told him he meant to adulterate his foreign tobacco with it in small quantities, it not being safe to either use it alone, or mix it freely. As a matter of consistency, there is no question but the free growth of tobacco should be admitted, although it is a grave question whether such leave and licence would conduce to any great good.

SALT AS A MANURE.

The second ordinary weekly meeting of the members of the Royal Agricultural Society for the new year was held on Wednesday, Feb. 17, in Hanover-square, when, in accordance with previous notice, Mr. J. B. Lawes, of Rothamsted, St. Alban's, introduced the subject of "Salt regarded as a Manure."

The Chair was taken at noon by Lord Feverham.

At the commencement of the proceedings, after the nomination of several new members, it was announced that a book of designs and plans for labourers' cottages had been presented to the Society by Lady Caroline Kerrison. In acknowledgment of this gift a vote of thanks to her Ladyship was proposed and carried.

Mr. LAWES said: Mr. Chairman and gentlemen, the subject which I am about to introduce this morning is the action of common salt as a manure. Salt is a substance which is very largely used by the agriculturists of Great Britain, and which is supposed to possess very valuable properties. Amongst other advantages, it is said largely to increase the production of grain and straw, and to improve the quality of both. It is also said to produce very great effects on certain crops which have a marine origin, for example, mangel wurzel—a crop for which it is very much used. It is said to fix ammonia in the soil, and also to convey moisture in dry seasons. A great many experiments have been published, but I do not propose to refer to them, because last year certain owners of salt works offered a prize for the best essay on that subject; and no doubt when that essay is published it will contain all that is known in reference to salt, as far as its good qualities are concerned. The great difficulty of a scientific person, wishing to investigate the properties of manure, in the present day, is to arrive at definite conclusions with regard to the actual value of such things, to form a correct pounds-shillings-and-pence notion of the effects which they produce in the soil. I propose, therefore, to pass over, this morning, all that has been said or written on this subject. Many of the experiments which have been reported certainly could not be accepted in the present day. For instance, Sinclair states, as the result of experiments in 1817, that 45 tons of dung gave between 40 and 50 bushels of wheat per acre; 6½ bushels of salt gave above 70 bushels of wheat per acre; and 45 bushels of salt gave above 80 bushels of wheat per acre. We could not, I repeat, accept such experiments in the present day. I therefore propose to pass over all the published experiments with regard to salt, and to confine myself to investigations which have been carried on upon my own farm, in order to arrive at more reliable conclusions with respect to it. The field, which I am now about to refer to, has been under experiment for a great many years. In 1839 it was taken off my farm for the purpose of being subjected to careful experiments. In 1840, 1841, 1842, and 1843 it had four corn crops taken from it without any manure being applied, in order that it might be got into an unfertile and level condition. In 1843 it was sown with wheat, and it has been in wheat ever since that period.

The particular experiments to which I am going to refer are two parallel experiments on plots A and B, consisting of not quite half an acre each, and running parallel to each down the field. With one exception these two plots have, for 20 years, received exactly the same amount of manure; and they are, I may state, artificially manured with chemical salts. In 1844, 1845, and 1846 they received the same manures; in 1847 one received rather more artificial manure than the other, and therefore I pass over those years. The table to which I am going to refer contains the mean average produce of 1848, 1849, and 1850, the mean average produce of 1851, 1852, and 1853, and then the produce of the last ten years. The difference between A and B is this: they both received exactly the same amount of artificial manure; but A, unlike B, received for three years together 3 cwt. of common salt per annum in addition to the other manures. The parallel is exact, with that exception; and if there be any difference in the produce it must be due to the salt. I believe that the only way to arrive at correct notions in matters of this kind is to trace the produce, year by year, for a great many years. Sometimes when a manure has been put in the soil, the ensuing year happens to be favourable, and this may not be the case at another period. Therefore, what is wanted is to follow the results down from year to year for a considerable length of time. Now, if you look (referring to a table) at the mean produce of 1848, 1849, and 1850, the years previous to the application of salt, you will see that the produce was 32½ or 32¾ bushels in each case; showing that the crops of wheat were extremely alike. There was, in fact, no difference between them. Again, in 1861, 1862, and 1863, the years in which A received 3 cwt. of salt per acre per annum, and B did not, the produce of wheat per acre was exactly the same, being 80 bushels in each case. Then, if you take the next ten years, you find the produce again nearly alike. The produce of the 16 years was in each case 37¾ bushels; showing that there was no trace whatever of the action of the 9 cwt. of common salt. Some persons, I am aware, think that although salt may not increase the quantity of produce it, improves its quality. Let us see, then, what was the weight of the produce per bushel. In the first three years the weight was a little higher in A than in B; in the three years when the salt was applied, 1851, 1852, and 1853, the difference was again slightly in favour of A, though not so much as it was before; and in the next ten years, the weights per bushel were almost exactly alike. It made no difference whatever, you see, whether we used 9 cwt. of common salt or not. I now come to the total produce of straw and corn. The total annual produce of the first three years was 5,936 lbs. against 5,976 lbs., a difference of only a few pounds; in the three years when salt was used the produce was as nearly as possible the same; and in the ten years after the salt was applied the average produce was 7,799 lbs. against 7,811 lbs., again a difference of only a few pounds. In the total average produce of the whole period of sixteen years the difference was only 12 lbs.—7,222 lbs. against 7,234 lbs. The next table is a calculated

table showing the relation of corn to straw. Salt is supposed to strengthen straw and improve its quality. The table is calculated for 100 parts, showing the proportion of corn to 100 straw. In the first period, before salt was applied, there was 57 lbs. of corn to 100 straw, and a fraction, against 56 lbs. Therefore A was in that case rather superior to B. In the next period we have 42.6 against 41.7, there being again a slight difference in favour of A. In the next ten years the case was reversed, and the result was in favour of the land which had had no salt, the figures being 49.6 against 50. Again, in the sixteen years the comparison is 49.7 against 49.8, being a very little in favour of B. Practically there is no difference in the proportions of corn and straw, taking the whole period. I must now speak of the proportion of offal corn to 100 lbs. of dressed corn. In the first three years A. was in this respect slightly superior to B. In the three years in which salt was applied, the reverse was the case; that is to say, the offal corn was a little larger in quantity when the salt was used. In the third year of this second period, I may remark, the balance was still greater against salt; the offal corn was then 17 to 18, showing that the salt had the effect of injuring the quality instead of improving it. In the next ten years the result was 7.4 in A to 8.8 in B. If you take the sixteen years you find that the results are almost identical; that is to say, following on the table as far as it goes, we see no result whatever from salt in the case of experiments very carefully made, and extending over a great number of years. Turning now to the action of salt upon another crop, I may remark that on my own farm I generally grow from ten to fifteen acres of mangel wurzel a year; and, following the common custom of agriculture, I have usually applied salt as well as other things to the land. My usual course has been to apply half a dressing of dung in the autumn, and half a dressing in the spring, and to put on the top of the dung 2 cwt. of guano or some other artificial manure per acre, and 4 cwt. of salt; the salt and artificial manure being strained on the top of the dung, and ridged in, and the seed being drilled on the top. As everybody says that salt is good for mangold wurzel I always use it; and, assuming that salt did increase the crop, I was anxious to ascertain whether this increase possessed nutrition qualities, last year I ordered one acre to be manured with 5 cwt. of salt, another with 10 cwt., and another to be left without any salt, the other manures being the same in the three cases. One thing which struck me immediately was, that the acre which had no salt grew faster than those which had it. There could be no mistake about the matter. The salt evidently appeared to check the growth of the mangold wurzel. This went on for a good many months, and at one time there was a large difference between the one set of roots and the others. The crops were very carefully weighed, with the following result:—The produce per acre in bulbs without salt was 21 tons 2 cwt.; with the smaller quantity of salt it was 20 tons 10 cwt.—a difference of 12 cwt.; and where 10 cwt. of salt was applied there were only 14 tons of bulbs. Again, as regards tops, where there was no salt the produce of tops was 7 tons 6 cwt., where the smaller quantity was applied it was 8 tons 5 cwt., and where the larger quantity of salt was used it was 7 tons 4 cwt. Therefore the result was, that where the smaller quantity of salt was used there was more top and less bulb, and where the larger quantity was used less top and less

bulb. These experiments are for one year only, and therefore I do not rely much upon them. I am satisfied that this year salt has checked the growth of mangel wurzel rather than promoted it. This may have been because the season was a very dry one, but the effect was certainly very distinct. I have one more set of experiments to bring before you. They are not my own, but were conducted some years ago by Mr. Kearey, who was then managing the Earl of Leicester's farm: Mr. Kearey was a very strong advocate for salt, contending that it did a great deal of good. He was kind enough to send me the result of some experiments which he made in the years 1852, 1858, and 1854, upon wheat. His practice was, he stated, to put 6 tons of dung, 1 cwt. of nitrate of soda, and 2 cwt. of salt—mixed together—per acre. In some cases his separate experiments are comparable with one another. For example, in one case he used only 1 cwt. of nitrate of soda, and in another 1 cwt. of nitrate of soda with 2 cwt. of salt. In the first year the cwt. of nitrate of soda with the salt gave 37½ bushels, and the cwt. of nitrate of soda without the salt gave 42½ bushels; in the second year the nitrate of soda with the salt gave 83½ bushels, and the nitrate of soda without the salt 85 bushels; in the third year the nitrate of soda with the salt gave 47 bushels, without the salt 49½ bushels. In the three years there was a difference in favour of the nitrate of soda without the salt of 8½ bushels of wheat and 6 cwt. of straw. These experiments were sent to me by Mr. Kearey to show the great value of salt, whereas I might cite him as a witness against salt as a manure. It may be that sufficient care was not exercised in making the experiments in that case; but, be that as it may, the result is to show a loss in three years, arising from the use of 6 cwt. of salt, of 8½ bushels of corn and 6 cwt. of straw. These, my lord, are all the experiments which I think it desirable to bring forward on this occasion. Some years ago a French commission was sent to this country to inquire as to the effect of salt on corn. I never saw the report of that commission; but the other day I wrote to Monsieur Barral, an eminent man in connection with French agriculture, and the editor, I believe, of the *Journal d'Agriculture Pratique*, to make inquiries about it; and his reply is as follows:

“Paris, Feb. 8, 1864.

“Dear Sir,—In reply to your favour of last Friday, I beg to let you know that the report you mention is written by Mr. Milne Edwards. It was printed at the *Impression Nationale*, at the expense of the French Government, in January, 1850. Mr. Milne Edwards was then trying his best to prove the possibility of restoring the old tax on salt without doing any injury whatever to agricultural interests; consequently he declared most readily that salt is useless as a manure, and his opinion may be suspected of being tainted by some political prejudices. Nevertheless, I believe in the truthfulness of that part of the report, and am myself prepared to declare that salt is of no value at all as a manure, if used without any other fertilizing matter. But I am ready to alter my opinion respecting mixtures, as double decompositions may be produced in the womb of Mother Earth. The *Report sur la Production du Sel* is rare enough amongst our booksellers. However, I may try to purchase a copy for your account if you desire my doing so; or, if you want only to look at it, I can send you the copy from my library on condition of your sending it back again when you have done with it.—I remain, yours most truly, J. A. BARRAL.”

Thus you see M. Barral is of opinion that salt has no value as a manure itself, but that it may act usefully in conjunction

with other manures. So far as my experiments have proceeded, I have always used it in conjunction with other manures; but, as you have seen, the results have not been satisfactory. It may be asked, Why should not salt be useful when we find it existing largely in a certain class of plants? There can be no doubt that salt is to be found in a certain class of plants; but the question of the value of salt depends, I think, not so much upon what is found in the plant as upon what is taken from the farm. If you find salt is taken out of the land by a plant which is consumed on the farm, as is the case with mangold wurzel, you may conclude that there the salt is not exported, and does not therefore need to be replaced. As to grain, an analysis of ripe corn will show that it contains little or no salt. There is just a trace of salt, and nothing more. Animals undoubtedly contain salt. I have had a great many animals analysed at different times, and you may assume, as a general rule, that an animal, as he stands alive, contains about 3 per cent. of mineral matter. An oxen contains about 4 per cent., and sheep and pigs about 2½. Three per cent. may be taken as an average of mineral matter, and of this about 8 per cent. is salt. Therefore an ox weighing 1,000lbs. contains about 2½lbs. of salt, and a sheep or a pig weighing 1 cwt. contains about 4 ounces of salt. Hence the amount of salt required by animals is very small indeed. A great many experiments have been made for the purpose of ascertaining the amount of salt which falls on the land through the medium of rain. I do not wish to go into figures, but there can be no doubt that a large quantity of salt does descend in that way upon our soil. In our climate, surrounded as we are by sea, the rainfall of salt is decidedly larger than the amount carried off the land in any shape or way, and consequently, so far as our fields require salt, they obtain it from that source. Without expressing any very strong opinion on the subject, I would say that the general conclusion at which I have arrived is that salt does not act beneficially as a manure, though it has occasionally an action of some kind or other—that there are farms which are kept in the highest possible condition which never receive salt, while there are others also well cultivated that do receive it. I am not at all prepared to say that these last are not as well farmed, or do not produce as good crops as the others. I cannot help thinking, however, that the large amount of money which is expended annually on salt as a manure throughout the British isles is not returned in the produce. There may be some cases in which it is, but I think that as a general rule the outlay of money is not returned in increased production.

The CHAIRMAN: Have you made any experiments, Mr. Lawes, with regard to the effects of salt in the feeding of cattle?

Mr. LAWES: Yes, my Lord, I have. When we come to the fattening of animals, we should, I think, be very cautious in using salt. If we give them as much as they would like to have, we shall certainly not find them increasing in the proportion that we could wish. It may be all very well to give them a taste of salt, but great care should be taken not to go to an excess.

In reply to Mr. Dent, M.P., who thought that Mr. Lawes might have used an excessive quantity of salt on his farm,

Mr. LAWES said: Four hundredweight per acre has been my ordinary dose of salt. My object was to grow large crops, and I assumed that mangold wurzel was likely to benefit in that respect by the use of salt.

Mr. DENT: But applying such a large dose of salt may

have retarded the growth of the crop. It has often been found that too large a dose of artificial manure has done injury in that way; and may not that have been the effect in your case as regards salt?

Mr. LAWES: That is possible; but there was plenty of plant; there was, in fact, an identical plant throughout.

Mr. FISHER HOBBS: I was not present when Mr. Lawes began to introduce this subject, and therefore I have risen to ask him what was the character of the soil and the subsoil of the farm where his experiments were tried? It is admitted that very much depends on the character of the soil, as well as the climate, of the neighbourhood where salt is used; and I am afraid that, unless we enter a little into particulars, the discussion to-day may produce an erroneous impression in the country (Hear, hear). So far as my experience goes, I may remark that in the eastern parts of England, where we have a dry climate, we find, especially in the case of maric plants, to which class Mr. Lawes will admit mangold wurzel to belong, that salt is very beneficial. We also perceive that along the coast, where the air is impregnated with salt, you can grow mangold wurzel, even without farmyard manure, better than in other situations. Not only so, but the quality of the crop is decidedly firmer, and mangold is generally admitted to contain more saccharine matter there than in parts of the interior where high farming salt is carried on. Therefore I think the remarks which Mr. Lawes has made to-day only show that, so far as his experiments have gone, they have not proved salt to be of very great service. We have found in my own county that where salt has gone through its course, especially on maric and other similar lands, it has not produced the same advantages that it did previously. I myself have used salt to a considerable extent at some periods of the year, and I have been somewhat annoyed at having my attention called by some of my neighbours to the bad appearance of my wheat, particularly after frost, where salt had been applied. When the land has become hard from the effects of frost, humidity in the soil has made the wheat crop of a purple colour, and apparently injury has been done. One great benefit of salt in our dry climate is, perhaps, to be gained in the destruction of many insects in the soil. This is a very important point, because for the last few years insects have been very injurious, not only to our root crops, but also to many of our cereals. The second set of experiments to which Mr. Lawes referred also appears to me to require explanation as regards the character of the soil. May I be allowed to ask him whether the artificial manures to which he alluded may not have acted in a different manner from what they would have done had the land been farmed on the four-course system, which is usual in agriculture? I know very well that we cannot lay down any general rule with regard to modes of cultivation or the application of manures; but I do not agree with Mr. Lawes that, on the whole, salt has been too highly valued by farmers. I think he will find, on examination, that even in a humid climate salt is beneficial. Some years ago I was down in Cornwall, where what is termed fishery salt is available, and that article appeared to be used almost universally for stiffening straw. In my experience I have seen fields of wheat where 3 cwt. of salt per acre had been applied, and the straw was remarkably white and very stiff, while in other cases a much smaller application of salt has apparently produced an equally beneficial effect. On the other hand, I have seen salt prove very injurious when applied to a crop of swede turnips, though when applied to mangold on the same soil it has pro-

duced a good effect. We see in our gardens how beneficial salt is to asparagus, which is a marine plant. Sea weed, which of course contains a considerable proportion of salt, is now extensively used, and the more its effects are seen, the greater is the demand for it. I did not rise, my lord, for the purpose of opposing Mr. Lawes, but merely to show that salt should not be run down as if it were a thing of no agricultural value; for I think there are soils and climates where it is very beneficial when used judiciously.

The CHAIRMAN: Mr. Fisher Hobbs having alluded to the destruction of insects by salt, I would observe that I have seen it applied when the fly was injuring turnips, and it has proved very effectual. I should like to hear from Mr. Hobbs whether he has seen that kind of benefit produced by salt alone.

Mr. FISHER HOBBS said he had never found any active property of that kind in salt when applied by itself, but in combination with other manuring ingredients it had operated in the manner which he had mentioned. They required a more powerful substance to destroy the fly; and it should be applied when the plant was damp and humid, for it would then act most powerfully and beneficially upon the leaf.

Mr. DENT, M.P., would like to know whether Mr. Lawes had made any experiments with salt on grass land. There had been a general notion prevailing that the application of salt to rough or coarse grass had a tendency to produce a finer kind of herbage. He had always been in the habit of applying salt for mangold wurzel. For some years he grew very good crops, but he did not believe that for the last four years any one in Yorkshire had produced a satisfactory crop; yet the crops there had, he believed, been grown very much in the same manner every year, and with the same proportion of salt. As regarded the insects, the use of salt had certainly, in Yorkshire, had the effect of stopping the maggot, which was eating the leaf.

Dr. VOELCKER said he had no doubt that salt, like many other good things, might be used with great advantage in particular cases; that it might be used without any good or any bad effects; and, further, that it might be used with decided disadvantage. From what he had seen on a large scale in passing through different counties of England, and from his enquiries into the circumstances under which salt had been used, he had come to the conclusion that in light and sandy soils salt was often, if not generally, used with very great benefit; while on heavy soils it was attended either with no advantage whatever or with decided disadvantage. There could be no question that the character of the soil had a very great deal to do with the utility, or the reverse of utility, with which salt could be applied to the land. Amongst the properties of salt there was one which belonged, he believed, to all very soluble saline matters; he meant the property which they possessed of retarding the growth of plants when they were applied in quantities of above 3 cwt. per acre. Salt certainly retarded the growth of plants; and for that very reason it was, he believed, that it was of such great utility on the lighter soils. It kept the plant for a longer time vegetating and in good growing condition, and the final result was that there was a larger produce. That was decidedly the case with regard to mangolds. He did not think they could shut their eyes to the fact that in the eastern counties the moderate use of salt had very materially increased the root crop; and he believed it did that in virtue of its retarding the growth of the plant. In lighter soils, when dry weather sets in, roots were very apt to dwindle away, or to yield only half crops.

By applying salt in moderate quantities, provided the land were otherwise well manured, they prolonged the life of the plant; the mangold wurzel crop did not then go off so rapidly, and a larger crop was ultimately obtained. But the reverse of this was the case when salt was applied to heavy land. There they ought to use manures like superphosphates, which tended to bring about early maturity, and not manures which tended materially to retard the growth of plants. He had found that in some parts of Gloucestershire the mangold crop was taken up before it was ripe, and that therefore in places where the soil was a stiff clay mangolds were not held in such repute as they were in other parts of the district. The question was, in fact, entirely one of maturity. They might either take them up as early as the beginning of October, or they might keep them till after Christmas. Salt was taken up in immense quantities by plants. Some time ago he made some experiments on that subject, and he was amazed at the enormous quantity of salt which he found plants to absorb. He almost succeeded in pickling cabbages (laughter). Salt being assimilated by plants, circulated in them; and, according to their structural differences, some plants were benefited and others destroyed by salt. Cabbages would take up an enormous quantity of salt. He had seen salt taken up by the roots of a plant crystallising on the leaves. This property of assimilation in salt was very useful for some purposes, but injurious in others. The question was, in fact, altogether one of soil. Therefore he believed they were not justified in saying on the one hand that salt was of no use, or on the other that it was of very great use. It depended on the application which was made of it whether it would be useful or the reverse. Some years ago he made some experiments on grass land with salt and with nitrate of soda. Now nitrate of soda pushed on the growth of grass, and secured a larger produce. Salt, on the other hand, checked it to such an extent, that if they used on stiffish land as much as 10 cwt. per acre, they would get less crop, even though nitrate of soda were used with it. Cattle were very fond of salt grass, naturally preferring sweet to rank herbage; and if, especially when out of condition, cattle were placed in fields where there were large deposits of ammoniacal manure, salt would be of great advantage in checking rank vegetation and sweetening the herbage. But, then, while salt sweetened the herbage it diminished the total amount of produce. He had nothing more to add, except that his last year's experiments in mangold, so far as they went, tended to confirm the view taken by Mr. Lawes. By the use of various quantities of salt, beginning with 1 cwt. and going up to 9 cwt., he obtained results which did not prove that on that particular soil, which was a heavy calcareous clay salt produced a beneficial effect.

Mr. J. HOOKER (Oatlands, Walton-on-Thames,) said: Having made some experiments with salt, he had put down the results, which did not at all accord with those of Mr. Lawes. He took the land in 1860 in a very foal condition. Ten acres of that land he was obliged to fallow. Four acres by the side of them, and with precisely the same kind of soil, he planted with mangold wurzel, for which crop he applied 4 cwt. of salt per acre at different periods of the year. The soil was, he might remark, a rather stiff clay on the banks of the Thames, resting on a sandy subsoil. In 1862 he sowed these plots with fluff wheat, and watched to see which would yield the best result. The four acres that were salted gave 7 sacks and 2 bushels per acre, of good quality; the ten acres which were not salted gave 5 sacks per acre, of tailing

quality. The plant was precisely the same over the whole 14 acres. Up to the time of blooming the wheat all looked remarkably well, and he thought he was going to have a very large crop; but the ten acres which had received no salt entirely broke down, and the crop was very bad. He selected samples of straw to see what was the cause of this failure, and whether salt or the want of it had anything to do with the result. On examining the ash of the straw on the salted land he found that it gave 83 per cent of silica; whereas on examining the ash of the straw on the land that was not salted, taking some of the best straw that could be found on the piece, he found 78 per cent of silica; showing that the land which was salted gave the largest per-centage of silica. Moreover, the straw of the ten acres was by far the most brittle of the two. In 1869 he conducted a series of experiments on the same kind of land, though not the same pieces. He agreed with Professor Voelcker that a small quantity of salt was better than a large quantity on stiff land, and that it ought to be used sparingly on each application. In the case to which he referred $1\frac{1}{2}$ owt. of salt per acre was sown broadcast on the 12th of May, 1863. A portion of the land was not sown with salt. The following was the result of this experiment: The land salted gave a produce of 2,476lbs. of wheat per acre, and the land not salted gave a produce of 2,337lbs. per acre; showing an excess of 139lbs. per acre on the salted land. Further, the land salted gave a produce of 3,399lbs. of straw per acre, and the land not salted a produce of 3,180lbs. per acre; showing 239lbs. per acre extra on the salted land. This showed a large excess of straw in proportion to the wheat, and that was accounted for by the finer quality of the straw. The straw grown on the salted land contained more mineral matter than the other straw, and consequently had a greater weight.

Mr. LAWES replied: It might be said, he supposed, that his land was not favourable for an application of salt; but his experiments with mangel wurzel were carried on, not upon experimental land, but as part of his ordinary farm practice. The soil was a heavy loam resting on yellow clay. Mr. Kerey's experiments were also part of what is termed farming practice; and, though he said that salt was a capital manure, the results which that gentleman gave tended to show the contrary. He appeared not to have analyzed the results of his own experiments. He (Mr. Lawes) agreed with Professor Voelcker that when salt was applied to grass lands the herbage looked better and the cattle seemed more fond of it; but he doubted, nevertheless, whether the grass contained the best meat-producing qualities, nor indeed did he think that salt ultimately increased the amount of produce. He also concurred in the Professor's opinion that salt checked the growth of plants; but whether that was an advantage to the farmer was another question. As regarded cattle, they knew that if cows fed much on mangel wurzel, they were apt to scour. What they ate operated on them like a dose of salts. As agriculturists, they did not want to accumulate salt in mangel wurzel; what they needed was good feeding qualities, and the question of the value of salt and other manures de-

pendent on their influence on the feeding properties of crops. Admitting that salt arrested the growth of plants, the question arose, he repeated, whether agriculturists really wanted that. Did they wish their crops to be stopped at particular stages of growth? They all knew that in some years crops were too ripe in autumn, and at others not ripe enough. That was a matter which depended on the seasons. One year there was a hot summer, ripening the crops too early, the next year perhaps the case was reversed; and a manure like salt would perhaps be beneficial at one period and not at another. In conclusion, he did not deny that salt might be beneficial in certain cases; but, generally speaking, he doubted whether the large amount of money paid for that article by agriculturists was returned in their produce. If salt were used judiciously on lands which were suitable to it, there might be benefit; but when applied extensively and without great care and discrimination, the crop would not, in his opinion, pay for the outlay.

Mr. FISHER HOBBS said Mr. Lawes appeared to think that the scour in cattle arose in a great degree from the salt which was present in mangold-wurzel. In opposition to that he would remark that when sheep had too much vegetable matter, and showed symptoms of scour in consequence, almost the first thing the shepherd did was to give them a handful of salt, and in nine cases out of ten it proved a good correction.

Mr. LAWES observed that what he had referred to was an accumulation of salts in mangold, which gave them a purgative character.

Mr. FISHER HOBBS would suggest for Mr. Lawes's consideration, whether mangold-wurzel, being a marine plant, might not on that account take up more salt beneficially than swedes and common turnips. He had himself observed that when salt had been used to a considerable extent for the mangold-wurzel plant, it produced no injurious effect, whereas the swede died off with the same amount of salt.

Mr. LAWES said he had, in fact, never given mangold-wurzel without salt; but, this year, having occasion to make experiments in relation to this question, he found, to his surprise, that his crop seemed much better without salt than with it. He had been as steady a user of salt as any one, and, if questioned on the subject, he should probably have said that mangold being a marine plant required salt; but, after his recent experience, he should look a little more carefully to his consumption of salt another year.

Mr. R. BARKER moved a vote of thanks to Mr. Lawes for the able manner in which he had introduced the subject, observing that it was a very important subject, and that the society might rely upon it that Mr. Lawes would do his utmost to arrive at sound conclusions.

The CHAIRMAN, before putting the motion, said he agreed with Mr. Barker as to the importance of the subject, and he believed that agriculturists would gladly avail themselves of any information to be derived from the practical experience of reliable persons who engaged in the investigation of it.

The motion was then agreed to, and Mr. Lawes having returned thanks the proceedings terminated.

THE PRESENT STATE AND PROSPECTS OF THE FARMING INTEREST.

The present state of the farming interest, and its future prospects, are matters which assuredly deserve serious consideration. On the one hand, we have a low range of prices for grain, and on the other a high range for stock. To some, the former appears more than usually depressing; and they entertain and express doubts that it will ever be remedied. This, therefore, is the first point to which we must direct our attention.

That the prices obtained for grain are low is a fact which does not require proof; but, before we despair of improvement in this respect, we must just call to our recollection what has been the case in past times. Nor is it necessary that we go far back for information. In 1850, the average price of wheat was 40s. 8d. per qr.; last year, including December, it was 44s. 8d.—that is, wheat averaged 4s. 5d. per qr. more last year than it did in 1850. Reckoning the yield at 3½ qrs. per imperial acre—or, say, 6 barrels per Irish acre, calculating the wheat to weigh 60lbs. per bushel—the screeble difference in the prices obtained in 1863, compared with those obtained in 1850, amounted to 15s. 5d. per imperial acre, or, say 20s. per Irish acre, in favour of 1863. So that, bad as we are, we have been worse, and got over it. But this will be more clearly understood, perhaps, by some of our readers, if we compare the prices current in the Dublin Corn Exchange at the present time, as compared with those current at the same date in 1850. We take our information from the reports given in the *Farmers' Gazette* of Jan. 12, 1850, and Jan. 16, 1864; and we quote in barrels for the purpose of comparison, although it is now illegal, and ought therefore to be an obsolete denomination of weight:—

January 12, 1850.		Per brl.	
		s. d.	s. d.
White wheat	.. ..	23 0	to 24 0
Red do.	.. ..	18 0	to 21 6
Oats	.. ..	9 0	to 11 0
Barley	.. ..	11 6	to 14 6
		Per cwt.	
Flour	.. ..	12 6	to 14 6
Oatmeal	.. ..	10 0	to 11 6
January 16, 1864.		Per brl.	
White wheat	.. ..	24 0	to 26 6
Red do.	.. ..	21 6	to 24 6
Oats	.. ..	9 0	to 12 0
Barley	.. ..	12 0	to 16 6
		Per cwt.	
Flour	.. ..	14 0	to 20 0
Oatmeal	.. ..	10 0	to 13 0

While we have, therefore, an advance even on most of the lowest qualities of the foregoing articles, we find that, on the best descriptions, the prices obtained at present, as compared with the corresponding period in 1850, are higher in the following proportions; White wheat, 2s. 6d. per barrel; red wheat, 3s. per do.; oats, 1s.; barley, 2s.; flour, 6s. 8d. per cwt.; and oatmeal, 1s. 6d. per do. What the difference per acre amounts to is easily understood.

But the average of wheat did not see its lowest point in 1850, for it was only 38s. 6d. per qr. in 1851, or 6s. 2d. under last year's average. Then it rose, year by year, until it became 74s. 8d. in 1855, the highest price it had attained since 1818, when it was 83s. 8d. per qr. These prices

gradually fell, until the average in 1860 was 43s. 9d., or 11d. per qr. under that of last year.

We mention these matters to show that there is not the slightest reason for despondency, or for supposing, as some seem to do, that the present state of the farming interest is altogether unprecedented, and even utterly hopeless. It is subject to variations, no doubt, but so also are the manufacturing and commercial interests of the country. In the case of these, as in that of farming, there are periods of dulness as well as periods of prosperity; and such will ever be the case.

But the altered state of the fiscal regulations of the country, with reference to the free importation of grain, is sometimes adduced as an conclusive against the profitable production of grain in the British Islands. This point of view has been well met in an article which appeared recently in the *Morning Express*, in which the prices of wheat for the last twenty years are given and commented upon. The writer of that article sums up the general results in the following manner:—

Year.	Av. price.	Year.	Av. price.	Year.	Av. pr.
	s. d.		s. d.		s. d.
1844	51 8	1851	39 6	1858	44 2
1845	50 10	1852	40 9	1859	43 9
1846	54 8	1853	53 3	1860	53 3
1847	69 9	1854	72 5	1861	55 4
1848	50 6	1855	74 8	1862	55 5
1849	44 8	1856	69 2	1863	44 8
1850	40 8	1857	56 4		

In the first ten years (five of which passed away under a protectionist régime) the average price of wheat was 49s. 5d. per qr.; while in the second ten years, in which a free trade policy was triumphant, it was 56s. 11d. per qr.; so that the British farmer, who considered himself ruined in 1846, has actually had a better average return upon the most important of his products than he had before. It may be objected that this result is due to the Russian war of 1854, 1855, and 1856, and the failure of the French crops in 1861. So, no doubt, it is; but, so long as human nature remains what it is, wars will occasionally prevail, while crops are constantly failing in one or another quarter of the world. Thus, Hungary, which supplied France in 1861, had, last year, a very bad harvest, while France is now rejoicing in the prospect of plenty. The first four years of transition from protection to free trade formed, doubtless, a period of suffering; but, since then, if figures go for anything, the British farmer has been able to hold his own, as not only have prices been better sustained, but production has been largely increased.

If the grower of grain has, as we have seen, a balance in his favour, comparing present prices with those at the corresponding part of 1850, the bettered position of the farming interest at the present time will be still more strongly brought out when we compare the present value of other articles of farm produce with that which the same articles bore during the corresponding month and week of 1850. For this information we again turn to our market columns, at the respective dates; and the first point we

shall bring forward is the relative value of fat stock in the Dublin market:—

January 12, 1850.	January 16, 1864.
Beef, per cwt., 36s. to 48s.	.. 56s. to 66s.
Mutton, per lb., 4½d. to 5d.	.. 8d. to 8½d.
Veal, per lb., 8½d.	.. 8d. to 9½d.
Pork, per cwt., 32s., 36s., and 44s.	.. 40s. to 44s.

The difference in value is thus very great, particularly in the three first items, being a rise of 17s. to 20s. per cwt. in the case of beef, and 8½d. per lb. in that of mutton, the two principal articles of consumption. What that difference amounts to in the case of beasts and sheep of average weights may also be easily understood. We do not mean to say that the difference in value goes into the pocket of the feeder; for lean stock has risen quite as much, if not more, comparatively, in value. Store beasts were very low in price at the period to which we are referring, and could scarcely find purchasers; whereas, now everything sells well. Breeders and rearers—and especially those who rear what they have bred—have profited more from the difference in value than the feeder, although we are aware of cases where feeding is paying, and has paid satisfactorily enough, being attended to as it ought to be done. Where this is not the case, the high prices of lean stock are more felt by those who finish the stock, or, as we should say with reference to some cases, who attempt to finish the stock for the butcher.

There is another point which a comparison of present prices with those current at the corresponding period in 1850 brings out, and which is of considerable importance. We have often heard it said that the importation of foreign cured provisions has seriously injured prices of home produce. We again turn to the reports in the *Farmers' Gazette* for information, and we find that while bacon rated, on the 12th of January, 1850, in the Dublin market, at 40s. to 44s. per cwt., the same article was worth 54s. to 56s. per cwt. on the 16th inst., being an increase in value of 14s. and 12s. per cwt. Again, hams brought 45s. to 46s. 8d. on the 12th of January, 1850, and 56s. to 76s. on the 16th January, 1864—an increase in the value of the home produce ranging from 11s. to 29s. 4d. per cwt. Whatever effect importations may have had on inferior qualities, it is evident the value of the better description of home produce has not been reduced. In fact, we think the principal effect of these importations has been to bring cured provisions within the reach of many consumers to whom provisions of a similar kind, but of home origin, would have been inaccessible at present rates.

Pursuing our comparison of prices, we find that bladdered lard, which was worth 40s. to 43s. per cwt. on the 12th of January, 1850, brought 52s. to 54s. on the 16th inst.—an increase of 12s. and 11s. per cwt. in value; that cool butter, which was sold in the Dublin market, at the date mentioned in 1850, at 7d. to 9d. per lb., was quoted on the 16th inst. at 9d. to 1s. 2d. per lb.; and firkin butter, which brought from 50s. to 70s. per cwt in 1850, rated, on the 16th inst., from 90s. to 102s., in Thomas-street, and 112s. to 120s. in the Dublin Spitalfields-market. The difference in the value of these articles now, as compared with the corresponding period in 1850, is, therefore, very considerable; so much so, indeed, that although, no doubt, gratifying to producers, it is seriously felt by consumers, to whom such a rise in value as that of 50s. per cwt. in the price of best butter, and of 40s. per cwt. in that of an inferior article, is no joke.

Hay, which was worth £2 to £3 16s. per ton on the 12th of January, 1850, brought £2 6s. 8d. to £3 13s. 4d. on the 16th inst.; and straw, in like manner, shows an increase in value, the price now being £1 6s. 8d. to £2 per ton, against £1 to £1 5s. per ton at the corresponding period in 1850. The difference in value, on average crops of both articles, may be easily reckoned.

Skin wool was worth 11½d. to 1s. 0½d. per lb. on the 12th of January, 1850; while it was quoted on the 16th inst. at 1s. 5d. to 1s. 6d. per lb. Fleece wool was not quoted in 1850, at the date we have mentioned. Potatoes were worth 2s. 6d. to 3s. 8d. per cwt. on the 12th January, 1850, the highest quotations being, apparently, potatoes for seed; while, on the 16th inst., their reported value ranged from 2s. 4d. to 2s. 8d. per cwt., seed potatoes not being quoted.

We have therefore, at present, a considerable increase in the value of nearly every article of farm produce, as compared with the prices obtained in 1850; and this surely proves sufficiently that there is no reasonable ground for despondency with regard to the future prospects of the farming interest. But we may also learn that the business of farming must be conducted in a much better and more systematic manner in future than it has been conducted in times past. We must make the land produce more than it has done; and we say so, because it is, under Providence, quite in our power to make it do so. We must drain more generally, cultivate more thoroughly, and manure more amply. These are the steps which must be taken: there is no avoiding them. Future operations must be based upon them, otherwise success cannot follow our exertions. We have repeatedly urged the superior advantages of a mixed system of farming, combining the raising of grain with the breeding, rearing, and fattening of stock, both sheep and cattle; and the present position of the farming interest forms, in our opinion, one of the strongest arguments which could be brought forward in support of our views. The farmer who depends on grain alone (as many do) is prevented from sharing in the benefits arising from the high value of stock, for, in this part of the kingdom, he does not grow cattle-feeding crops; while the grazier, who depends wholly on grass, is not only hampered by the high prices he must pay for lean stock, but he is also shut out of the fat stock markets for, perhaps, the best six months in the year. The man who follows a mixed system of farming has advantages over both; and, even supposing that the prices of grain range lower than he considers profitable to grow and dispose of it as such, he has a better market for it at home in his fattening stock, while its consumption in this manner enables him to manure more highly, and thus fulfil, to some extent, one of the conditions which are essential to success. We press this matter, because we look upon it as one of deep importance to the community; and we would, at the same time, again remind people that farming, now-a-days, is not the business it was at one time, although there are not a few who seem to think that it has not undergone any change. Very great exertion is especially demanded of those who own and occupy the secondary and inferior classes of soils, which constitute, in fact, the largest proportion of the area of our cultivatable land. We have indicated the points to which their attention must be directed; and we candidly tell them that, while we believe there are reasonable grounds for hope for the future, there is, nevertheless, no time to be lost in settling about the various matters to which they are called upon to attend, in order that this hope may be fully realized.

—*Irish Farmers' Gazette.*

THE FARM HOUSE:

THE COTTAGE, AND FARM OFFICES.

THE MATERIALS USED IN THEIR CONSTRUCTION.

It would be easy, if it were necessary, to descant upon the importance to the practical farmer of the subjects here indicated in our title; but this is not necessary, so abundantly evident is it to any one who gives even the hastiest consideration to their bearing on the every-day labours of the farm. We do not, in the notes which we are about to present to the reader, propose to go at all deeply into the discussion of the arrangement and construction of the buildings of the farm; as indicated above, it is only to *some* of the points we purpose alluding, and enough will be done if we succeed in making these points not novel or striking merely, but practically useful, and easily available. There are many points which appear commonplace enough when first alluded to, and some remarks which may appear to be mere truisms, to which every one easily assents, but which, nevertheless, although bearing most closely on the subject, and being, indeed, of the highest practical importance, are frequently overlooked or ignored. To a few of these we hope to be able to attract the attention of our readers, not only pointing out how certain things *should* be so, but *why* they are so—a double way of viewing things, highly productive of benefit in practice. Without further preface, then, we proceed to the discussion of our subject, taking up first the consideration of some points connected with the *farm-house*, promising that our remarks are based on the supposition that this is to be a first-class structure, it being obviously an easy matter to modify our recommendations to suit a second-class one.

It seems to be stating a very commonplace truism when we say that "seeing a house is a place in which to live, it behoves the man who proposes to live in it, so to consider its arrangements that he may live in it comfortably." And yet it is a truism which, like many others we might name, is often ignored or overlooked, so often, indeed, that of many it may be said that they think a house is more to look at than to live in. Yet, seeing how much of his time a man has to spend in his house, and how often, therefore, he is to be pleased with its comforts, or annoyed by its defects, it does seem odd that he should rarely know whether he has to enjoy the one, or endure the other, until he takes possession, when knowledge comes too late for remedy. For it should never be forgotten that the mistakes made in the planning of a house cannot be rectified when the plan is perpetuated in stone or brick and mortar, or, if rectified, rectified only at large expense and much trouble. This consideration, then, should urge all men proposing to build to consider well *what* they really are going to build. Necessary in all cases is this, but more especially necessary in the case of farm-houses, where defects in arrangement not only affect the comfort of the inhabitants, but may add greatly to the labour of the domestics; this last consideration being of no small importance in such establishments where labour is necessarily great. When we see badly-planned houses

(and their number is by no means a small one), it is difficult to know who is most to blame—the architect or his client. That architects often commit gross mistakes in planning, is true enough; yet it is equally true that clients have put it in their power to do so, when by the exercise of a little examination of the plans, and of some thought as to their peculiarities, they might have prevented it. With some architects the rule often is, to make the elevation, or external design, dictate the plan, rather than the plan dictate the design. The point seems unimportant; but a glance at its bearings will show that it by no means is so. In his endeavour to please the eye by the picturesqueness of its outlines, the architect thinks first and chiefly as to how the building will look when finished. Prompted thus, the outline shapes itself in his mind, and is finally decided upon; and the outline thus obtained must be filled in with apartments as best it may. A plan thus obtained may be good and convenient; but the chances are equally in favour of the fact, that it may be bad and inconvenient. A part may be useless, or, if useful, may be inconvenient; but that part must not be sacrificed, as it may be detrimental to the elevational character or design. Thus it happens often that the plan is "cramped, cabined, and confined," in consequence of the requirements of the design, which design has been foreshadowed in the architect's mind from the beginning, and which has more or less markedly influenced the whole internal arrangements. Seldom as this process may be done, it has nevertheless been done sometimes; and being likely to be done again, it is worth while to warn the reader of the danger of the practice, and make him aware of the advantages of the converse mode of proceeding—namely, to let the plan dictate the design. We are far from ignoring the importance of having a design beautiful to look at—far indeed—for we deem it of essential importance, in a merely mental point of view, that we should not have anything staring us constantly in the face which causes regret or uneasiness. But we hold that, if we obtain the essential conveniences in a plan, a clever architect will be able to give that plan a character distinctive and pleasing in elevation. We simply insist upon this as the *primary* consideration: that your house shall in its arrangements add to *your* comfort while living in it, and to the convenience of *your* servants while working in it; and these can only be obtained by being carefully considered in the plan. Whatever else you obtain, you will be sure to obtain this—a characteristic outline, which will tell its own story, and give evidence of mind; and where that is, we defy a house to be a mistake.

To secure perfection in the plan, do not plan in a hurry; and as, in order to ensure good building, you should build in the spring and summer, let your winter-evenings be dedicated to frequent talk over your plan. A writer possessed of a keen knowledge of human nature states, in one of his admirable essays, that he believes there is no enjoyment so real as that obtained while discussing at the winter's fire-side the various arrangements of the house you are to live in in the following season; and there is, we have reason to know, a vast deal of truth in the remark. Discus-

sion is sure to elicit opinion; and from a variety of opinions you can elicit practically valuable hints. If you have the good fortune to have the society of ladies at your fire-side, take them into counsel over the matter. Ladies generally have a much better idea of what constitutes real comfort in a house than gentlemen; and on all points connected with the relative arrangement of apartments so as to save labour on the part of the servants, we would far sooner take the opinion of an intelligent female than that of the cleverest architect who ever handled drawing-square and pencil. Sure are we that many of the absurdities of home arrangement which we have seen perpetrated in houses, the plans of which have come from the studios of celebrated architects, would never have been made had a female acquainted with house management and possessed of some power of thought been consulted in the matter. In discussing, as we recommend you to discuss, the prepared arrangements of your house during the winter, omit no opportunity to scribble in your note-book such modification in your plan as may be proposed from time to time. You may get a capital hint quite casually, which you fancy you can bear in your memory; but in trying to bring it back again after the lapse of a few hours only, you will be often mortified to find that you can no longer grasp it. Your various scribbles of plans or notes of suggestions will be a register to which you will refer with advantage, and it will help you greatly to mature your plan. All this may appear to some to be unnecessary, as it may appear to be trifling; but nothing is trifling which is important; and to say that the arrangements of the house you are to live in, which will at all times minister to your pleasure or add to your discomfort, are not important, is to display an utter ignorance of the great truth, namely, that life, comfort, and happiness are more influenced by little things than by great ones. All this fine attention which we have recommended you to give to the plan of your house may appear unimportant to one who is not to live in it; but to you, who are, the matter assumes a very different aspect. You may say of it in the words of the classical poet:

“How small to others! but oh, how great to me!”

But the importance of carefully maturing the plan at first, before the final drawings are made, or a brick or a stone laid, may be urged from another point of view. If after the house is begun to be built you find, that you would like certain alterations to be made, or find as some do, that they *must* be made, so gross being the mistake in planning which has given rise to the necessity—you thus break through the contract, and open the door to charge for *extras* being made by the builders. Now, there is nothing so unsatisfactory as these extras: no matter how large may be a man's means, he is always dissatisfied with any addition to the original estimated cost. It seems to be a principle of human nature that if a man is told that a thing is to cost so much, he is disappointed if it comes to cost more, even although the extra sum may be trifling in the extreme. Architects are often blamed for causing the final cost of a house to exceed its estimated cost: but clients are to blame as often, nay oftener than the architect. Remember that the contract with the builder who engages to erect your house for a definite sum is only binding so long as the specifications and plans are rigidly adhered to. These once being altered, even in the most trifling degree, the contract is no longer binding, but extras are allowed. Mature your plan then well, before you hand it over to your architect for the final drawings and specifications to be made from it; and being decided upon, let no inducement urge you to alter it—that is, if you really wish to have your house constructed at the estimated cost.

The plan of the house being decided upon, the next point of consideration is the *site* which it is to occupy. This should not be hurriedly decided upon; and one point we would urge upon you is, when you personally inspect the proposed site, that you should inspect it in the worst weather you can have. If the site in any way favourably impresses you, then you may make sure that it will impress you more favourably afterwards. It is a bad plan to choose your site on a fine day, for nearly every place looks charming under the influence of clear air and bright sky. As a house set upon the top of a hill cannot be hid, so neither can the surrounding scenery be hid from the house; the highest part of rising ground would, therefore, be considered, where taste alone is the standard, the best position for a house. But many things come in to modify this rule: elevated positions are generally exposed to blustering winds and to dashing rains; and they involve labour in reaching them either on foot or in conveyance. It does not follow, however, that a low position is more sheltered; for it is true enough that a stronger wind may rush through a valley than along the sides or top of the hills which enclose it. In this matter of site the middle course will be the safest to follow. Let the elevation be moderate, and let it be near a road, and if in a valley or rather on the sloping sides of it, let it be on the southern side. A low site near a marshy spot must be carefully avoided, and one also on the immediate margin of a piece of stagnant water, or the banks of a slowly running stream. In those situations not only does damp arise from the surface of the water, but it frequently happens that the ground rises from the margin up to the surrounding land so that the drainage of it is brought down to the site of the house, rendering it damp. A moderately elevated site not only admits of refreshing breezes to blow round the house, but of the water of the soil being drained easily away as well as the sewage matters. Wherever you build look out for the finest view; it is truly lamentable at times to see a house with its face turned from an enchanting prospect. But even in thus securing a fine look out, regard must be had to the actual aspect of the house. Light has such a remarkably good influence on the health of man—and we mean direct light from the sun, not reflected light—that we hold it to be an essential point in selecting a site that it should have a sunny aspect. That is best secured by placing the principal front, out of which the living-rooms look, south-east. But while having the majority of your principal rooms front thus, let one of them have as due a western look as you can get. For an afternoon room nothing can be pleasanter than to have the windows commanding a full view of the western sky, with all its marvellous beauties of light and shade, and the gorgeous colouring of sunset effects. We have said that the site of your house should be near a road; but not too near. There is an essential vulgarity in placing a house so close upon the public pathway—let the reader remember we speak of rural, not street districts, where compulsion as to site is a rule—that it shoulders itself like a rude fellow into notice, forcing as it were your criticism upon it, and speaking, as walls can speak, as plainly as possible, “Here I am: admire me.” A retiring position for a house, like a retiring disposition in a man, is always pleasant. But while a near retirement and accessible seclusion are aimed at, these should not be pushed to an extreme. We like a house to be seen, but seen at the trouble of some looking for it; we therefore would counsel you to give the public glimpses of it through shady trees and clustering shrubs, partly seen and partly hid; showing that while the occupier has resources within himself of books or company, rendering the gazing out upon the public pathway unnecessary, he is still accessible. We have no sympathy with the selfishness which detakes a man shutting his house out from public gaze, hid

behind frowning walls or exclusive palings. It is in these things, and such as these, that a man's house may be an index to a man's character. Trees upon a site always improve it, but they should not be too numerous, or too near the house: if so, they will obscure the light too much, making the room gloomy, and they will tend somewhat to make the house damp by dropping moisture upon the ground near it, and preventing the warmth of the sun's rays to act upon it. It is a disputed point, whether it is best to have a site on which trees already grow, or one free from them, so that you can plant at will. Where the site possesses a few fine old trees, spreading branches, and graceful trunks, retain them there by all means; to cut down trees of this sort, unless they actually encroach upon the site, is like taking away a life. Thickly wooded sites are by no means common in this country; but where they are, there are certainly advantages, as a writer on site well points out, "in having such a basis for ornamental operations." "It is," as he remarks, "a great saving of time and labour to buy your shade-trees already grown. All you have to do in such cases is to cut out roads and walks wherever they are wanted; to open up a prospect here, and plant a denser thicket there, and so to smooth out the tangled locks of Nature as to develop her finest charms." This is all very well where it can be done, but such situations cannot always be found combining also the other important features to which we have just alluded. Well, where they cannot be found we would select one promising the other desirable qualities, and then proceed at once to plant the ground with the best trees and in the best manner. Whether one lives to see his trees attain great size or not is really of no consequence. "There is," says the writer above quoted, "more enjoyment in planting trees and watching their yearly improvement than in sitting idle under trees already grown. A thousand associations spring up from year to year, and cluster around such trees. They are *your* trees, you selected them, planted them, nursed them in their feebleness, defended them from their enemies, rejoiced in their prosperous growth, and now you gaze upon their spreading boughs and thickening shade with a sort of paternal pride and affection which you feel towards no other trees." There is much true knowledge of human nature displayed in these remarks: we commend them to the attention of the reader. There is such a desire implanted within us to create, that we believe more satisfaction will be derived from clothing your house site with the beauties of the green leaves, spreading branches, and fragrant flowers, than by choosing a site where all this is already done for you. In so much as you surround your house with shading shrubs or trees, you, while shutting yourselves comparatively in, shut out correspondingly the view. This will, however, be the case as regards the lower rooms only; and even in their case partially, for we presume the reader will follow the suggestion we have already dwelt upon, as to having your house retiring, but not utterly secluded. Through the gaps then, admitting the gaze of the passer by, you will see the outer view, and in the way best suited to please you, for it is a curious thing that half-concealed charms heighten the pleasure, and that in the inherent yearning after mystery we desire to know what is not fully revealed to us. This principle is much overlooked in landscape gardening, and in setting out the environments of a house. If you wish to have the full and expanded beauties of the view, you can ascend to the upper storey, or, better still, the prospect-tower, with which we advise every farm-house of a superior order to be provided. We can speak from experience, not only of the pleasure derived from a vantage point of this sort, but of the value of it; for you can look fully down upon your farm-buildings, and take in at a glance the general features of your adjacent fields. Nor is such a place a bad place

for the quiet contemplation which all right-thinking men desire to have at times, aided, as it may be, in the genial summer time, with the quiet whiff of a cigar. And this talk of what may be called a "supervision tower," or prospecting post, brings us to advert to a point which has assuredly received discussion enough, and that is *the relative position of the farm-house to the farm-steading or offices*. We have already said that we look upon the command of a fine view from, or, at least, a pleasant position for a house, as a matter of some importance in a physical as well as a mental point of view. Yet, so lightly have some thought of this that they recommend the farm-house should occupy a site so near the farm-steading, or rather should form so complete a part of it, that the farmer may be able from its windows to command a full view of all the operations going on in it. This recommendation is based on the assumption that a farmer, to be successful, must have his eye continually on the operations of his farm, and watching constantly the labour of his workmen. But these operations are not confined exclusively to the steading, and men work in the field as well as in the fold. Moreover, this recommendation is quite antagonistic to one feature of human nature, which is that business hours over the business place is to be left. All men do not certainly take this view, and those may be like the miller who said he could not go to sleep without the clatter of his mill dinging in his ears; but this is not generally the rule, for we find that from the merchant who desires to fly from his counting-house to his box in the suburbs, to the manufacturer who hurries from his mill to his villa in the country, men have a strong desire to leave business cares for awhile behind them. Why then should farmers not have this privilege accorded to them? Are the sounds of the lowing of cattle and the grunting of pigs so delightful on their ear, that they are to be greeted by them on the first dawning of early morn, and at the last lingering shade of dewy eve? And in these times of sanitary reform, when, in the graphic language of that savoury science, "stinks" have been carefully classified, and their dangers to health duly registered, are farmers to be free of the list, and the emanation from cattle courts, dung-heaps, and liquid manure tanks, to be considered not only a good deal odoriferous, but innocent in their influence upon health, and to be wafted round the house, not bearers of disease, as sanitary reformers have taught us that *elsewhere* they are, but balmy and healthy as the scents from a bean-blossomed field? In sober seriousness we have not any sympathy whatever with those who apparently look upon a farmer as one to whom the usual amenities of society and the luxuries of life are to be denied, but who, on the contrary, is to be condemned to daily drudgery. While we are no advocates for the cultivation of luxurious habits amongst farmers—rather, on the contrary, of a noble and manly simplicity befitting the dignities which we take to be the grand characteristic of their calling—we nevertheless think that they are entitled to all the quiet comforts and refined elegances which men of other callings, not half so intellectual, demand and receive. The close contiguity of the farm-home with the steading implied in the fact that its windows may overlook all that is going on upon it, does not meet our notions as to site. It is all very well to say that "a master's eyes are worth a hundred pair of hands," and that where the windows of his house overlook his offices, that this eye-service can best be done. It implies, at least, that he is always looking, or often looking out of his windows—not a very dignified occupation for any one truly. All the fair requirements—fair for the master and man alike—of an honest supervision will be met by having the farm-house near the steading, within such easy reach that when so disposed the farmer may step down to the offices. And, to our way of thinking, more influence will be exercised upon the men to induce

them to work faithfully by the unexpected or irregular visits which their master thus makes, than by personal over-looking, which partakes too much of the character of slave-driving, and too little of the quiet characteristics and manly independence of modern farming to be to our taste. Again, as we have already stated, those who advocate the near proximity of the farm-house to the farm-steading, seem to forget that as large a proportion of the work of a farm is done in the field as in the steading. The truth, however, is, that mere proximity to the steading will not ensure work going on within it being always well performed; it is, as we have just stated, in the habit of the farmer continually going about, carrying with it the consciousness on the part of the farm-servants that it is better for them to be always attending to their duties, seeing that it is difficult to say when, how, and where the eye of the master may be upon them, or his presence regulating his conduct.

As regards the *soil* of a site, avoid by all means, if avoidance is possible, having anything to do with a heavy tenacious clay soil. It is almost impossible to have a house dry, where the soil is of this nature, unless at a great outlay. A gravelly soil is the best of all. But on whatever soil you build, it is essential that you specially drain the site. While the evil of a damp house is so universally feared, and deservedly so, it is a marvel that so simple an expedient as the *thorough drainage of its site* has not been more insisted and acted upon than it has. It is usual to recommend courses of slate laid in cement, or sheet lead, to be laid in the course of stone or brick just above the ground line; sometimes trenches filled with concrete to some depth, on which to build the footings or foundations of the wall; and in some cases layers of smithy clinkers, to be used instead of concrete. All these are but partially acting preventives of the disease of a damp house, and may very well be used, and used with some good result, if in conjunction with the thorough drainage of the site. The site of the house—and by this we mean a space of ground some yards wider on all sides than the immediate space occupied by the building—which should be surrounded completely by a cincture of tubular drains leading into the main drain. These form or act as the catch-drains, intercepting the water coming from all parts of the surrounding field to the plot on which the house stands, while the water of the plot itself must be led off by drains more or less numerous intersecting either its transverse or longitudinal section, according to the slope of the ground, and leading to the drains encircling the plot. This complete drainage of the site we look upon as essential, in close, tenacious, and what we call retentive soils; but may be modified in the direction of a simpler practice, in proportion as the soil of the site approaches the character of extreme dryness and lightness, in which case drainage may be dispensed with, and the usual method of building good foundations trusted to for the prevention of damp. Damp in its worst form generally arises from the moist condition of the soil, being worst near the ground, and gradually extending upwards. Damp, however, sometimes gets into walls where exposed to long-continued battering blasts of rain. Dryness of wall in this case is often attempted to be secured by covering the wall exposed to the prevalent storms by slates. These, however, look ill and are expensive, and are, moreover, not always efficient. By far the best method is to ascertain the direction of the prevalent storms, and specify that the walls on that side shall be of increased thickness, and be what is called a cavity wall. Indeed, this "cavity-wall" system is possessed of such peculiar advantages that we strongly recommend its adoption throughout. One excellent plan to secure dryness is to have the house, or part of the house, cellared under. You obtain another and a great advantage by this, in having places in which to store away

your provisions. We all know the difficulty there is to keep meat fresh and cool in summer time; and of all the expedients adopted to secure this, there is none so completely effectual as an underground cellar. We write in a district in which cellars are almost universally made to houses, even of the lowest class; and we are simply giving expression to the fact when we say that by their means a large saving is annually effected in the keeping of meat in good condition till it can be conveniently used, which would otherwise be rendered useless. We can conceive of no farm-house in its arrangements being perfect without one or more cellar apartments. In the cellar should be placed a stone-table, on which to salt meat, &c., when required. While upon the subject of prevention of damp, we would here point out one frequent cause of damp walls in the neighbourhood of the sea: that is, using the sea-sand in the preparation of the mortar. The affinity of salt for moisture is so well known that we need not enter further into an explanation of the matter. We know at present where the residence of an Earl is now uninhabitable from sea-sand having been used in the mortar with which it is built. In localities, then, where the builder may be tempted to take sea-sand, let him be looked sharply after, that he does not yield to the temptation. Let the use of clean, sharp river-sand be always specified; and if river-sand be not obtainable easily, and the sand be got from a pit, let it be examined to see that it is not highly impregnated with salt, which it may be from being in a locality at one time submerged by the sea in ancient times. We have seen a small sand-pit opened, which, fully one mile from the sea, was used for building purposes, although in reality sea-sand. Where the quality of the sand is doubtful, it is a good practice to wash it with water. In sea-side localities we have known parties tempted to use stones for building purposes, for cottages more especially, which had been exposed to the waters and the salt breezes of the shore: such stones are sure to effervesce and give out saline dampness in certain conditions of the weather. Such stones, if in abundance, may be considered good enough for cottage work. That we hold them not to be; for health is of as much importance to labouring men as to us, and health cannot exist where dampness is.

Having thus presented to you a few remarks on the site of a house, and the method by which dampness in its walls may be avoided, we shall now take up a few of the other points affecting the health and comfort of its inhabitants. We have already dwelt upon the importance of choosing a good site, so as to secure amongst other benefits that of a good view; but that view you will not obtain unless you have good windows through which to look at it. The influence of light upon the health cannot be over-estimated: not only is its deficiency the cause of low spirits and a mental depression, but the cause of physical diseases, which may be said to be peculiarly connected with the absence of light. Windows, therefore, should be large and well placed; and, above all, the sills should be low; so that, while sitting, you can easily without effort see out upon the scene before you. To secure this, the height of the sill from the floor should be eighteen inches, but not exceed two feet. As regards the proportion of a window relatively to the size of the room, it is difficult to give precise rules. It is better to err in excess than in deficiency, for this very common-sense reason, that if you have too much light, you can easily exclude it in any degree you wish; but if your window is so small as to give too little, you cannot at will increase it. But, as in a physical point of view light is essential to health, it is difficult to say that you can have too much of it. Before dismissing the question of size of windows, let it be borne in mind that you have the width in all the living rooms throughout uniform. By

this one set of window blinds will suit all; where this is not the case, considerable labour to your housewife will be involved. Again, it is of importance to study the relation of the window or windows of a room to the fireplaces in it. We have known the window of a room placed in the same wall in which the fireplace was, and close beside it; the result of which was that only one-half of the room was well lighted. The matter assumes greater importance in kitchens where operations are carried on incessantly at the fireside; and yet so often is this point overlooked, that it is no difficult matter to find houses where the window is placed in the position just described, the result of which is that the cook has no direct light to aid her. The matter is not much mended, if any, by having the window placed immediately in front of the fireplace, for, in that case, the cook will stand in her own light. The best position for the window is to the right or the left. Windows are generally placed in the centre of the walls of a room; but if, in addition to the central window or windows, we could, by having one in a corner, command a fine, or an additional point of view, we would not hesitate to place it there, although an architect might tell us we were destroying the symmetry of the room. Some of these corner windows we have come across have been the most delightful lounging windows in the house. For entertaining rooms, those deeply recessed bay and bow windows, now so generally introduced, are most admirable contrivances, and add immensely to the pleasures of a house. We may here point out the difference between the different classes of windows, as some confusion is apt to arise in the understanding of the terms. A bay window and a bow window are not synonymous terms as some think. Both are doubtless windows projecting from the line of wall, but in a bay window the lines are made up either of the sides of a hexagon or an octagon—a hexagon generally; while a bow window is part of a circle. A Venetian window is one in the line of the wall, but having three voids or openings, the central one being much wider than the two side ones. An oriel window is a projecting one, but is on the second not on the ground-floor: it may either be hexagonal or circular in its outline; generally, however, it is circular. A dormer window is an attic window projecting from the plane of the roof, so that its front is vertical.

The position of the doors of a room materially affects the comfort of the inhabitants. It is usually a bad position to have a door in the centre of the wall, for in this case you will probably find, especially in small-sized rooms, that you have not space on either side for articles of furniture you would like to place there. This attention to the position of a door is of even greater importance in the case of moderately-sized bed-rooms; we have known a door so placed that the only position for the bed was jammed up against the window. Close by the side of a fire-place in an entertaining room is also a bad position for a door; for in this case those sitting near the fire-place are more or less disturbed every time the door is used to allow of parties entering or leaving the room. The hanging of the door is also a matter of some importance; if hung, for instance, so that the hinges are at the side nearest the window, the door will on opening throw a shade upon the party entering. The light of the window should fall on the face of the door which is on the outside or passage-side when it is shut. The doors of small places, as water-closets, drawing-rooms, &c., should always open *into the passage or the largest room*, if they are entered from one room; by making them open into the closets themselves is absurd, as it is simply making a small space less.

As regards the sizes of the apartments of a house, do not be led away by any statements, however attractive and by whomsoever made, as to the importance of having your "company rooms" large and effective. By all means

have this if you can afford it; but do not secure it, we beseech the reader, if he prefer comfort at the cost of being cramped in the passage, the staircase, the bed-rooms, and the working-rooms as we may call them, such as the kitchen, the scullery, &c., &c. Let there be a fitness between all parts of the house; but if one part is of more importance than the other, it is, we take it, that part which comprises the rooms affecting the continual comfort of the inhabitants. Grand entertaining rooms are all very well, but we do not entertain every day; and they are purchased at a great price if for their sake, we feel as if we could not move in our lobbies, or were crushed into closets to sleep, or have our servants constantly grumble that they have no room to do their work in. We would strongly urge upon the reader, therefore, to look carefully after the *bed-room* and *kitchen* apartments. Nothing adds so much to the comfort of a man's life as good roomy bed-rooms, and nothing to the convenience of a family as plenty of them. Architects in claiming, and unfortunately getting ample space for the public or company rooms, and giving the least dimensions to the bed-rooms, seem to forget that in no one room does a man spend so much of his time as in his bed-room. It should, therefore, be so large as to give plenty of room, and to have the bed so placed that when the window or door is opened it shall not be in the line of direct draught. Ask a physician, and he will tell you that in cases of severe illness there is nothing he dreads so much as the confined room in which his patient is placed: the air in it is always foul, and can only be made fresh at a fearful risk. Looking at the question from all sides, we are strong advocates for large bed-rooms—indeed, for their being the best rooms in the house. For the confined *closets* which our architects and builders often deem right to give us by way of *bed-rooms*, we have a profound contempt. The same also have we for those miserable little boxes which are dignified with the name of kitchens, and those still more miserably small places they call sculleries, with which some houses are—we cannot say supplied, for that term implies satisfaction, but we may say are pretended to be supplied. It is altogether surprising how little consideration we show in our domestic arrangements for those who are to do our domestic work. We expect the work to be done, yet trouble ourselves marvellously little how far we supply them with the means to do it. Little better, we grieve to say, in this respect, are many of us than the Egyptian taskmasters of old, who expected their Israelitish slaves to make bricks without straw. Let, then, the kitchen in size, and all its appliances in completeness, be on the most liberal scale. A broad and generous hospitality is, we take it, one of the characteristics of a true farmer; but a consideration for the health, the time, and the labour of his servants is also another characteristic. Let the kitchen department of his house, then, show in all its details a capability of supplying the demands of the one and securing the necessities of the other. The position which a kitchen should occupy with relation to the entertaining rooms should be well considered. It adds to the comfort of a house, that those sitting in the public rooms should not be annoyed by the noise or by the smells proceeding from the working rooms: hence the latter should be placed as far as convenient from the former. We say as far as convenient; for we should not forget how much we add to the labour of our domestics when we cause them to traverse long passages or mount many steps. The necessities of the case will be met by placing all the working apartments completely at the back, and isolating them by a door at the end of the hall or lobby. To ease the labour of the servants, we would strongly urge upon the reader the adaptation of "speaking tubes" to his public rooms and bed-rooms, leading to the kitchen. Bells are all very well; but we

would use them chiefly to draw the attention of the servants to what we wished to tell them. The saving of labour by the adoption of this simple apparatus would be very great. If we analyze the reason why we want our servants, we will find that in the great majority of cases we want them to bring something which is actually within their own domains. When, therefore, we have only a bell, we ring for the servant to come; and after she has come, she has again to go back for the article we require, then to return with it, and finally to go back. With a "speaking tube," one journey will do the work of four. These considerations may seem very trifling ones; but they are not so—far indeed from being so. It is our duty to save our domestics from unnecessary and fatiguing labour. We can scarcely envy the man who, with even the largest means to gratify his various desires, does not consider those who minister to them. In a farm-house labour is necessarily so great, that every effort should be made to lessen it. While on the subject of the working department of the house, let us ask the Reader to see that the sleeping-places connected with it be capable not only of ministering to the decencies but to the comforts of those who do its work. "Servants' sleeping-rooms" is the phrase by which architects and builders term them: how they can have the assurance to give the name of room to such wretched cribs, as they too often are, is more than we can say. In truth, we have been often heartily ashamed, when examining the arrangements of a house, to note that part of it devoted to the servants. We dare say some of our readers will think we are "piling up the agony" sufficiently high when we say that in the kitchen or working department we are not sure but we would recommend "lifts," that is, contrivances by which various matters could be conveyed from one floor to the other. At all events, if in no other part of the house, have a lift from the churning-room of the dairy to the cheese-room above it.

The working part of the farm-house should have the following accommodation, and the dimensions stated may be taken as average ones for a farm of 500 to 600 acres in extent: First, a kitchen, 18 by 16 feet. This should be entered by a door from a passage, which should divide the kitchen from the public-rooms. The best form of fire-grate, both for economy in the consumption of fuel and for the facilities it gives for cooking purposes, is what is called the *kitchener*. The only objection to it is, that it is rather expensive, and, looking at the material and workmanship in it, often unnecessarily so. It will be long, we fear, before the prejudices of our servants, and we may say of ourselves, will enable us to use the much cheaper, and in every way as efficient cooking-ranges, or rather stoves, used on the continent and in North America. Having seen the practical working of these in the houses of the middle and poorer classes of France, Belgium, and in America, we can with confidence recommend them as the cheapest in first cost, and the most economical in working, of all the forms of cooking apparatus we have met with. The kitchen should be provided with a large dresser, the material for the top of which is sycamore or plane tree. The under part should be fitted up with a cupboard in the centre, the doors of which should open right and left, and have drawers of various depths in each side. Abundance of cupboard room should be given to the kitchen, and hooks and shelves. The scullery 12 feet by 10, should enter from the kitchen, and be provided with a furnace and double-copper, and a slop-stone or sink ranged along the wall and near the window, so that plenty of light may be thrown on it. The scullery may also be used as a wash-house, in which case the wash-tubs may be set on the slop-stone when being used. We would, however, recommend a small set-off from the scullery to be appropriated as a wash-house, in which wash-tubs should be put up

as fixtures, and supplied with hot and cold-water at some pressure. The scullery should have a door leading to the back part of the premises, and near this should be placed the fuel store.

The milk-room or dairy should be separated from the kitchen and scullery by a narrow passage, which may be partly fitted up as a closet or cupboard, so that the heat of these apartments shall not affect its temperature. A door entering from the dairy to the scullery might be useful when the utensils are to be washed, but the danger of this is, that it admits of vapours, smells, &c., to enter the dairy. It will, therefore, be better to go round through the kitchen. A dairy cannot be too perfectly isolated from apartments in which tainting vapours arise: the readiness with which milk absorbs these, and is spoiled by them, is something remarkable. The aspect of the dairy windows should be north or north-east; the latter is the best, and will be easily secured by making it at the back of the house, the aspect of which we have before recommended to be made south-east. For the walls of a dairy we know of no materials equal to the glazed tiles which can be had now very cheaply. Flooring tiles, with a glazed, or rather a hard vitrified surface, will be useful. The best shelves for the milk pails will be marble; where the expense of this is objected to, slate may be used, which is nearly as good. Both are kept easily from stains, especially the former, which flag-stone or wood are not. Water in abundance should be applied to the dairy. From the dairy a small room should enter, in which the butter can be made up, and in which it may be stored. The cheese-press may be placed in this. From this closet or room a "lift" should lead to the cheese-room in the floor above, in which also should be the servant's bedroom and closets. It is usually the practice to give the servants' rooms a complete isolation from the rest of the house, by a stair entering near to or from the kitchen. While we would give this stair for direct communication, we would insist upon a door to enter the servants' floor from the bed-room floor of the house, as we consider it as essential that the mistress of a house should be able at any time, and in the easiest way, to inspect every part of the house. The reason of this is obvious enough, on consideration. The isolation considered necessary may easily be obtained by providing a door to this entrance to the servants' floor.

We have thus run over a few points connected with the farm-house, which may be of some practical utility to the reader. We regret that time does not permit us to go fully into all their details; but the whole subject of house arrangement and construction is so comprehensive that it is impossible to do more in an article than glance at its leading features; indeed we may say not possible to give even a glance. We have given therefore, in the short space at our disposal, more marked prominence to points perhaps seldom thought of—not, however, because they may be novel, but because we conceive they may be useful.

We now offer a series of "type plans" of arrangements of farm houses. These are designed as suggestions merely, and may be modified according to various circumstances; and are to serve more as foundations on which to arrange plans, than as the definite plans themselves. From the diagrammatic nature of the illustrations, it will be perceived that no attempt at a scale drawing is made in them, and that the usual indications of plans, as windows, doors, chimney jamba, and the like, are omitted, the windows being simply indicated by the letter *w*, doors by the letter *d*, and fire-places by *f*; the object being merely to show the relative position of the apartments. We commence with plans showing the arrangement for small farm houses, and finish with those having a large extent of accommodation.

FIG. 1.

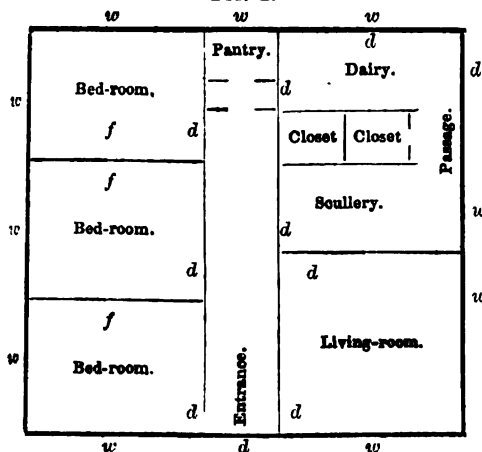
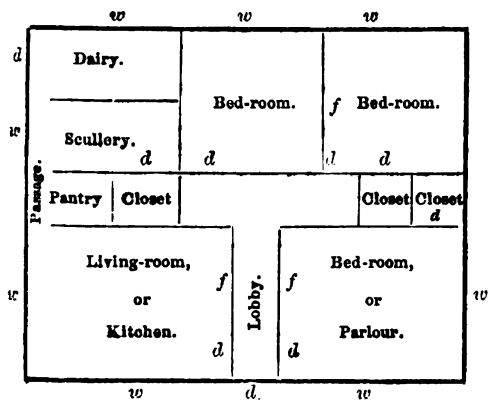


Fig. 1 represents a small farm house of one storey, with a square outline. The working rooms of the house are all on one side of the central passage or lobby, and the bedrooms on the other. On the working side, the scullery is placed next the kitchen or living room, and is entered therefrom by a door; or a second door may be made leading into the scullery from the passage or lobby. The dairy is at the (north) back of the house, and is separated from the scullery by closets, one of which enters from the dairy, or may be made to enter from the scullery, if more convenient; while the second of those closets enters from the passage leading from the scullery to the dairy. A large pantry (or bed closet) is placed at the end of the lobby, and is lighted by a small window, as indicated by the letter *w*.

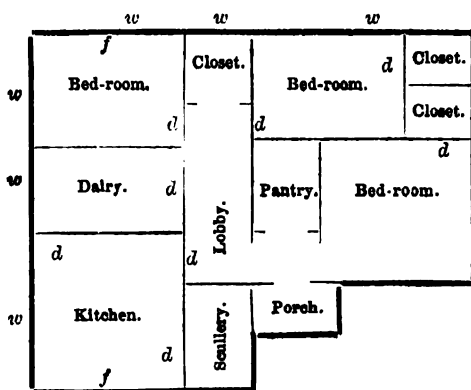
FIG. 2.



In Fig. 2 we give the plan of another form of square one-storeyed house, in which the kitchen, scullery, and dairy are all in direct communication with each other, as in Fig. 1. The bedrooms in this case are at the back, while the room corresponding to the kitchen may either be made a third and principal bed-room or a parlour. A closet enters from the scullery, a pantry from the kitchen, while the principal and back bedrooms have each a closet.

In Fig. 3, the square form is departed from, and projecting parts, or a set off, introduced. It is a one-storeyed house, as Figs. 1 and 2. There is a porch provided, opposite to the entrance of which there is a pantry. To the left the kitchen is placed. The dairy enters from the lobby, at the end of which is a closet, lighted with a win-

FIG. 3.



dow, and the door of which is provided with a casement to give light to the lobby. The scullery is placed next the porch, and enters from the kitchen. The two bedrooms at the end have each a closet.

FIG. 4.

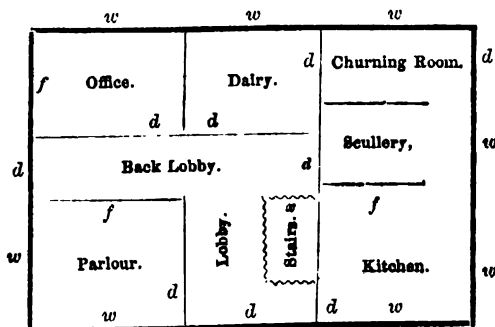
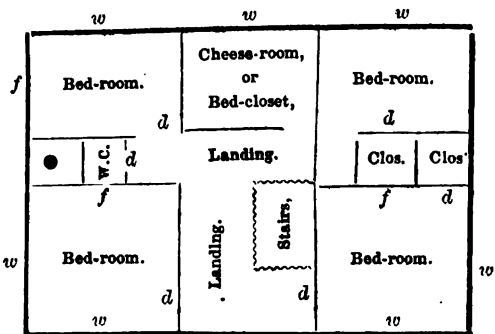


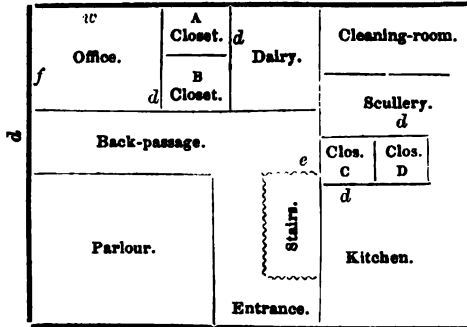
FIG. 5.



In Fig. 4 we give the ground plan, and in Fig. 5 the chamber plan, of a two-storeyed farm house. The kitchen, the scullery, and the churning room are all in connection. The dairy is entered from the back passage, as well as from the churning room. Next to the dairy, and close to the back door, is the office or breakfast-room. The parlour or sitting-room is opposite to the kitchen. In the bed or chamber-floor plan in Fig. 5 there is space obtained for two closets, one entering from the front or principal bed-room, the other from the back. A water-closet is situated between the two other bed-rooms; or if this is objected to, and a privy in the garden deemed the best, a clothes pantry may be put in place of it. The

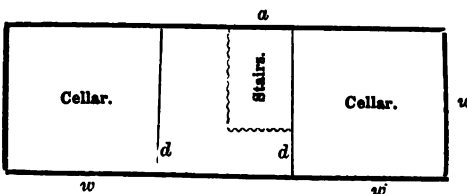
cheese-room is placed immediately above the dairy; or if cheese is not made in bulk, this may be made into a bed-closet. On comparing this accommodation in the ground or working part of the house in Fig. 4 with that in the plans in Figs. 1, 2, and 3, the reader will at once perceive that there is in Fig. 4 plan a lack of closet or pantry accommodation. There is nothing which distinguishes a bad plan from a good one more strikingly than the lack of accommodation of this sort. There cannot, indeed, in any house, be too many places of this kind: the careful and orderly housewife has always a use for them; and this, true of all houses, is remarkably so of farm houses.

FIG. 6.



In Fig. 6 we give an alternative plan of Fig. 4, in which we obtain a closet (A), entering from the dairy, in which to store butter, &c.; another closet (B), entering from the office; a third (C), entering from the kitchen; and a fourth (D), entering from the scullery. As some housewives object to a back passage, on the score of the draught passing through the house, this in the plan before us might be done away with, and the space filled up with a pantry or store closet.

FIG. 7.



We have already, in a preceding article, adverted to the importance of having cellar accommodation in the farm house. In Fig. 7 we give the plan of cellar for the house in Fig. 4. The stairs enter at the end (a) corresponding to the part (x) in Fig. 4.

FIG. 8.

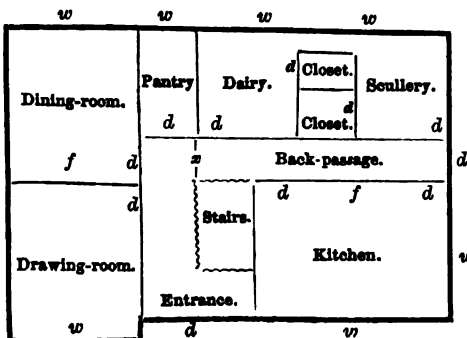
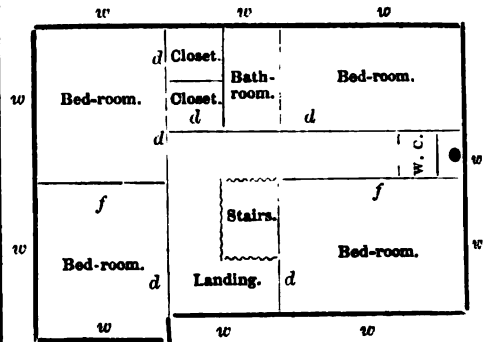
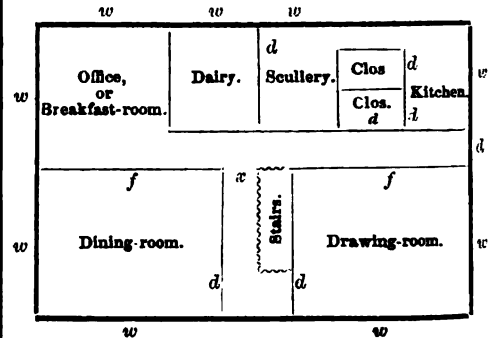


FIG. 9.



In Fig. 8 we give the ground plan, and in Fig. 9 the chamber plan, of a farm house, in which the working parts of the house are isolated from the living apartments by a door placed at x. The scullery is opposite the kitchen, the back passage being between them; a door leads from the kitchen into the back passage, immediately opposite to which is the door of the scullery. The dairy is entered from the back passage, or from the scullery, and ample closet and pantry accommodation is provided.

FIG. 10.



In Fig. 10, which is the ground plan of a farm house, the isolation of the working parts from the living apartments is obtained by a back passage, which is shut off from the house by a screen door at the point x.

FIG. 11.

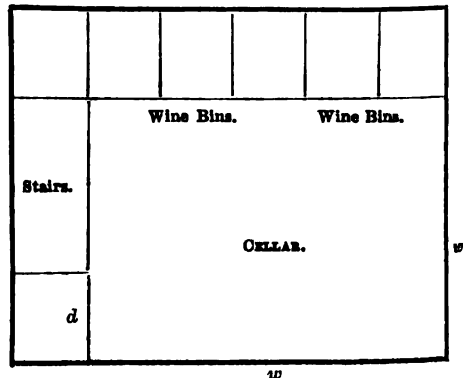


Fig. 11 illustrates the cellar arrangements of the house in Fig. 8; under the kitchen almost identically the same arrangement of cellar is required for the house in Fig. 10, the cellar of which would be under the drawing room.

In Fig. 12 we give the plan of a farm house with superior accommodation. In this all the working apartments are isolated from the entertaining rooms by a door at *x*. The smoking room may be dispensed with; or the servants' room may be used for this purpose. The smoking room and dairy are both of one storey in height, so that ample ventilation can be secured. The servants' room may be converted into a billiard room.

FIG. 12.

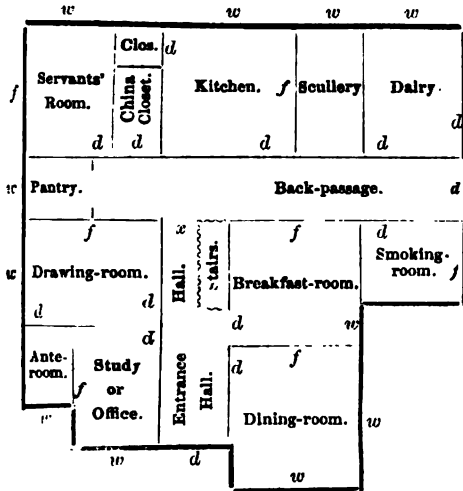
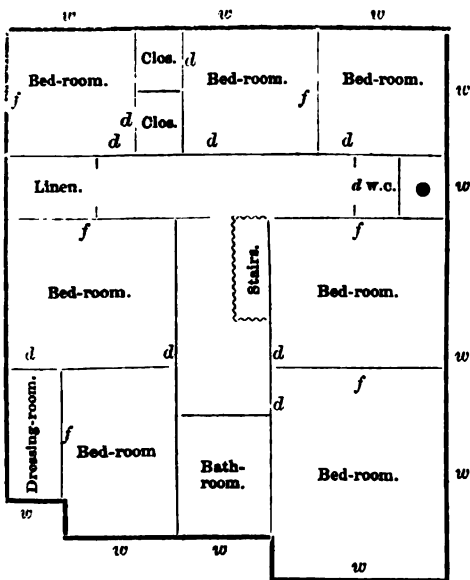


FIG. 13.



We have thus given a few suggestive plans; none of them will probably be fitting for particular purposes, some parts being redundant, some defective; but they will serve the purpose for which we have here inserted them, should they suggest an arrangement of apartments suitable for the case in view, by taking one part from one, and another from another plan. It is quite obvious that what will suit one farmer will not suit another. The first thing to do, then, is to ascertain how many apartments he requires, and the next how best they can be arranged to serve the

purposes of economical management of the household. As we have said before, so we say again, do not plan in a hurry, but let your plans be well matured; and having drawn out a sketch of what you think you require in your house, endeavour to re-arrange the apartments in another form, and, after so doing, sit down quietly to study it, and you will probably find that the second arrangement was better than the first; and that you may, after all, find a third suggested which is better than both; or even a fourth better than all the three preceding.

A word or two on the design of the house may here be permitted before taking up the subject of the cottage. Whatever the style—so called—you adopt, let plain elegance be its distinguishing feature rather than affected ornate decoration. It should be thoroughly free from all pretension, and indicative of the great dignity and worth of the calling of its owner. If money is to be spent upon it liberally, let this be laid out so as to secure thoroughness of workmanship, and the avoidance of all "gingerbread" work. As a writer beautifully remarks, the farmer's dwelling should "suggest simplicity, honesty of purpose, frankness, a hearty genuine spirit of good-will, and a homely and modest, though manly and independent, bearing. For the true farmer despises affectation; he loves a blunt and honest expression of the truth; and he shows you that he knows the value of a friend by shaking hands as if his heart acted like a magnetic machine on the chords of his fingers. It would be false and foolish to embellish highly the dwelling of such a man with the elaborate details of the different schools of architecture. We must leave this more scientific display of art and learning to villas and public edifices, and endeavour to make your farm house agreeable, chiefly by expressing in its leading forms the strength, simplicity, honesty, frankness, and sterling goodness of the farmer's character. Although we must recognise first of all the constant industry which gives so much dignity and independence to his life in the arrangements of the house mainly for useful ends, yet we would also introduce every comfort and convenience denoting the intelligence and ease of a farmer's life. The principles we would lay down for designing farm houses may be stated as follows, so far as the production of beauty is concerned: That the form of the building should express a local fitness, and an intimate relation with the soil it stands upon, by showing breadth and extension upon the ground rather than height; that its proportions should be simple and bold, and its ornaments, so far as they are used, should be rather rustic, strong, or picturesque, than delicate or highly finished. That in raising the character of the farm house, the first step which is really useful is to add the porch, the verandah, and the bay window, since they are not only significant of real but of refined utility." These remarks so thoroughly express our own sentiments, and express them so well, that we have chosen to borrow them as they stand, rather than to clothe them in language of our own.

We now come to take up some points connected with the labourer's cottage.

The remark has been often made that we may test the civilization of any community by the way in which a value or no value is set upon the life of its meanest members. However much some may be disposed to doubt the exact truth of this doctrine, it may, at all events, be safely allowed that if the lives of the poor and needy in any community are looked upon with indifference, and if, in the calculations of our daily business, the health and comfort of those who, though beneath us in the social scale, yet minister to the necessities of our life, are practically ignored or overlooked, the rank which that community occupies in the scale of civilization is not very high. We may safely, we think, admit that; but, while admitting, we at once condemn ourselves; for surely—up, at least, to a

very recent period—if the test had been applied to us, in the matter of our usage of the labouring poor, we could not well have stood it. For years such was the wretchedly inverted position of the two great classes of society, that the rich may be said to have cared less for the poor than for their beasts of burthen; the one might be pampered and caressed, while their keepers, and the class they sprang from, were only suffered to come between the wind and their nobility from motives arising from the fact that they were useful, and could not, therefore, well be dispensed with—necessities of existence, the evils of which had to be borne as best they could, as they could not be got rid of—a condition of society presenting in its features the very opposite of the happy days of old, so graphically sung by the poet, when

“None was for a party,
When all were for the state;
When the great men helped the poor,
And the poor man loved the great.”

But it may be said, and said truly enough, that this, or at least much of it, is changed; and that although we are by no means as yet distinguished as a nation where the happy condition shadowed forth in the lines just quoted is completely realized amongst us, still there is, upon the whole, a good feeling existing between the rich and the poor of our land, and that this crops out in a variety of ways, tending to minister materially to the wants, as well as to the comforts, of our labouring population. This is all doubtless very true; and while in no way setting up, or at all desirous to set up, the poor labourer as always affording an example of injured and oppressed innocence—knowing well, as we do, that he is often anything but that, being often, indeed, a very remarkably spicy bit of evil-dispositioned human nature—justice nevertheless compels us to admit that, in more ways than one, evidences are about us that we have not yet hit upon the best way to secure, not only the good will, but the best working capability of the labouring-man who helps us in our work; and this last condition, although a selfish one in the main, is by no means or in any way to be despised or overlooked, for quite clear is it to us that the highest moral worth is compatible with a close attention to our own interests; for he who does not do this puts it out of his power to attend to the interests of others, only we should remember this, that it is essential that we do attend to the interests of others as well as to those of our own. That in the matter of affording our labourers good house accommodation, using this in its widest acceptation, we have not as a rule considered either their interest, or our own is abundantly evident; and in this matter the interests of the labourers and their employers are thoroughly identical, whatever any one may choose to say to the contrary. The briefest consideration of the points involved in the question will show this; for as we pay a man to get so much work out of him, it is by no means a common-sense proceeding to force him to live under such circumstances as deteriorate his working capabilities; and that these working capabilities are deteriorated by bad house accommodation and cognate evils is now, after the experience of years, axiomatic enough. If we breathe bad air, or live in damp dark houses, we incur disease—more or less marked, certainly, according to the influences existing, but nevertheless existing, and therefore proportionately powerful in producing bodily infirmity and weakness. The healthier that we have our workmen the better for us, if not for themselves. Some one has called—did he do so, we wonder, in a spirit of truthfulness or mere irony?—the British workman the best living tool in the world. If so, we regret to say many workmen—we mean, of course, many a master—does not use these same tools of his in the best of fashions. We remember,

in reading this oddly suggestive sentence, how we speculated as to the coming of the time when masters would wake up to the conviction universally that to keep their living tools in good order would be a wise and business-like proceeding on their part. Bad tools are not worth the having at any price; but it is still more luckless for us if we ourselves make what otherwise would be, or might be, good tools, into bad. If the farmers, we then said, and say so still—if the farmers of England are to compete successfully with the difficulties which beset them, it is imperative that they should have all their tools, animate as well as inanimate, in the finest of working order, capable of doing not only good, but the best of work. But all this, of however much importance, is, after all, connected with the lowest view of the case; for we should never forget that we have in our animate tools a double power—we have to deal with a moral and mental as well as a physical organization, so to speak; and the truth is, ignore it as we may, that unless *both* have their full healthy development we do not obtain a perfect, but only a half machine, as it were, capable of doing half-work only. It may be well then to remember, therefore, that there is a close connection between physical and moral degradation. Considerations such as these are of the highest possible importance, viewed in connection with the position of our agricultural labourer. For 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, just, and merciful attendant upon the inferior animals of value which are 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 the property of others. Nor do we see how the substitution of steam for that of horse-power will at all lessen the value of a good servant—nay, rather much increase it; for he then has a higher care devolved upon him, and with him is entrusted a power as mighty for mischief when ill as it is for good when well directed.

The subject of improved or rather proper and fit accommodation for our labouring population, is one of vital importance as bearing on the best interests of Agriculture. These demand that every care should be taken to secure the comfort and well-being of those who are engaged in carrying on her processes, so that to the development of their physical shall be added that of their moral energies, making them at once able and intelligent servants. It has been said certainly, by some, that this has been done and is now being extensively done; while, however gladly acknowledging the efforts which have been made in this direction of improving matters, truth compels us to state that the little that has been done only proves how much yet remains to be done. And we can claim some knowledge of the subject, and bear our testimony, gathered from a personal investigation of many districts, as well as aided by enquiries in nearly every district of the United Kingdom, that there remains a vast deal to be done before we can lay any claim to having completed a reformation in the home accommodation of our agricultural labourers. We have heard much of the sanitary evils of large cities: they exist in as unmeasured if not in as densely a bad condition under pure skies and surrounded by green fields. The popular notion of rural districts is, alas! anything but the correct one; the stern realities of agricultural life prove that wretched hovels exist there, as well as in crowded alleys.

We may indulge in day-dreams of rural felicity, and may complacently draw our notions of country life from the got-up shams of stage conventionalities; but a day's

ramble amidst our rural districts and a few looks at the rural dwellings of *some* of our labourers, will soon dispel these pleasing fancies, and painfully prove that the air in our country hovels is no less fetid than in city dens; nor will the truth be less pointed, or the evidence less complete, that filth, aqualor, and their concomitants—disease, recklessness, and depravity—are not merely the adjuncts of the pestilential quarters of our towns, but may be met with in their most hideous form in spots far removed from the hum of cities, where the low wail of hopeless disease, or the shouts and curses of the ruffian may mingle with the song of the lark and the merry sounds of rural life.

Seeing, then, the importance of the subject, let us glance briefly at its leading features, with a view to eliminate, if possible, some lessons of practical utility. Taking up the various points in order, we shall *first* draw the attention of the reader to the *site* which the cottage should occupy; *second*, to the *accommodation* which it should afford; and, *third*, to some points of *construction* which it should embody.

What we have said on the importance of the drainage of the site, with reference to villas (*see* No. I. of this series of papers), applies with no less, if indeed it does not apply with greater, force to cottages. But the position of the site should not be lost sight of: let it, therefore, be as cheerful as possible, with a south-east aspect. Nor will its advantages be fewer, if somewhat near a road, so that passers-by may see the efforts—which should always be encouraged—of the labourer to add to his cottage surroundings the beauties and the fragrance of flowers, as well as the utilities of fruit and vegetables. Let as much air as possible sweep round the cottage: embosomed in trees it may be more picturesque to look at; but it will by no means be so healthy to live in. See, also, that a supply of fresh and pure water is within easy reach: *it is pitiable to know how much of the time of the cottager is lost, and how much labour is staid upon him by his having to go to a distance for water.* The last, but not by any means the least, rule or injunction to be offered in connection with site is, *let it be near the farm on which the labourer is to work.* This seems, in any aspect you view it from, to be a common-sense rule; but we regret, nay, we are ashamed to say, that it has not been acted upon, in too many cases. We have read with astonishment in a country paper an exulting statement, that some poor man had in the course of his life walked some twenty thousand miles to and from the farm he worked on and the cottage in which he lived, being compelled thereto from the fact that the cottage was not allowed to be on the farm. It was told as if it was a matter to be proud of; but had it been our case we should have felt ashamed of the imposition of absolutely unnecessary labour we had been inflicting on the poor man. To look at this condition of matters in the lowest light, it is as false in policy as it is wrong in morals. "Every farmer," remarks an able authority, while denouncing this silly practice, "knows the advantage

of having his team near his arable land; and in grazing counties, where the plough fields are generally at a distance from the homestead, he prefers his stable placed where the horses may be close to their work, well aware of the wear-and-tear and loss of having to take them two or three miles each way going and coming. He has but to apply the same reasoning to the case of his labourers, and he will no longer agree with the agent when he proposes to pull down cottages to reduce the rates. There is no greater saving than having a man close to his work; and in the narrowest commercial view, it is false economy to waste so much of a labourer's strength and time, as is consumed when he has to walk two or three miles every day from and to his home. There are more serious social considerations when it is remembered that much of the common interest between master and man is destroyed when they cease to be fellow-parishioners; that the distance of the labourer's home from that of his employer prevents that kindly visiting and assistance which the farmers' wives almost invariably bestow on the families dwelling around them in the same village, and that a population diminished beneath the natural demand, both leads to a lower system of cultivation, and impairs the proper relation of the employer to the employed. It is strange that any right-minded man should have ever gloried in reducing the number of human beings sustained on his property; and that while they boasted of two blades of corn or grass grown where one was grown before, they could point with complacency to the levelled parts where once the cottage stood, and the garden smiled."

As regards the *accommodation* which should be given to a labourer's cottage, much has been written and more said, and yet less of the one or the other might have done, and more practical results might have followed. The truth is, that no rule can be set down applicable to all circumstances. When we are building houses for ourselves we build them in accordance with our wants, or probable wants; why should not we adopt this simple common-sense rule in the case of cottages, and have different-sized cottages for different-sized families? For cottages with the *smallest* accommodation, a kitchen or "living-room," as it is most frequently called, and a single bed room will make up the accommodation required, for cottages with *medium* accommodation, a living and two bed-rooms; while for cottages with the *maximum* accommodation, a living room and three or four bed-rooms will be required. In addition to these, we wish the reader to understand that other conveniences in accommodation will have to be given: what they are we shall presently point out. While having cottages of different sizes, built either separately or in rows.—we prefer the separate or detached, or at most the semi-detached mode—it will, however, at times be advisable to have cottages built with unequal accommodation; that is, a cottage having the minimum, and a cottage, all under the same roof, having the maximum accommodation.

THE RAINFALL OF 1863.

It is always interesting, when a season has closed, to review briefly the chief points of interest that marked its progress; and the amount of rain and its distribution over different parts of the country is perhaps one of the most likely topics in a meteorological, and therefore in an agricultural, point of view to form an interesting subject for enquiry. We therefore propose to give our readers some insight into the fall of rain at a number of stations,

situated in widely separated localities, throughout the country, from which a good general idea of its distribution through the year may be gathered. We are happy to be in a position to give the figures from a greater number of stations than we have in former years been able to do; and as they are all from practical and well-known observers, the utmost faith can be put in their truth.

Our readers are aware that the rainfall varies very much

in amount, according to the locality in which the amount is collected, and therefore the result from one county would not be at all correct as representing that of a neighbouring one, or of the whole country. For this reason we have expended some labour in getting a fuller report of the past year. We need hardly add that, in comparing the results of last year with their respective averages, we have used the averages as calculated for the different districts which are the subjects of comparison.

There are one or two blanks in the following table, occasioned by imperfect results; where there exists any doubt as to the accuracy of an observation, we prefer to reject it, rather than run the risk of returning a reading that is not the truth.

We give in the following tables the returns from thirteen places, so distributed as to convey a very good general idea of the monthly fall from the extreme south, Guernsey, up to the north, as far as Culloden, Inverness. The time that the collection, &c., of these naturally employed, must be our excuse for their not appearing earlier in the year.

STATIONS.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches
Guernsey	4.8	1.1	2.7	0.8	2.9	2.8	1.2	2.7	4.5	5.2	4.2	3.0
Bournemouth	3.2	1.0	1.2	0.9	1.5	5.0	0.7	2.8	3.9	4.7	2.9	2.5
Little Bridy (Dorsetshire)	5.8	1.1	2.6	1.6	2.3	4.1	1.0	5.1	4.2	5.6	2.4	2.9
Worthing	3.8	1.1	1.3	0.8	2.3	3.6	0.4	2.6	4.0	3.5	2.2	2.7
Greenwich	2.6	0.6	0.7	0.4	1.3	3.9	0.9	1.8	3.2	1.7	1.8	1.1
Oxford	3.2	0.7	0.7	1.4	0.9	3.4	0.7	2.6	2.7	3.0	2.0	1.1
Bedford	2.1	0.4	0.6	0.8	0.6	2.2	0.5	2.3	2.4	—	—	—
Norwich	2.4	0.6	0.6	0.9	0.9	2.9	0.6	1.3	2.0	2.9	2.2	1.5
Grantham	2.5	0.2	0.6	0.8	0.6	2.6	0.7	1.0	4.9	2.4	2.4	0.9
Liverpool	3.3	0.3	0.4	1.3	1.6	3.7	1.5	3.0	4.7	5.0	2.7	1.7
Leeds	4.5	0.7	1.0	0.9	1.9	2.3	1.1	3.0	—	7.5	—	—
Otley (Yorkshire)	6.2	0.9	1.0	1.1	1.2	3.2	1.3	4.1	3.8	4.2	—	—
Culloden	6.0	1.9	0.6	3.1	1.2	1.9	—	—	—	2.2	—	—

There are many curious facts to be gathered from this table: first we notice the large rainfall for the month of January, at all the stations, but particularly at the most southern, and again at the most northern ones; amounts which are considerably above the average of this usually wet month.

But the most extraordinary phenomenon is that of the extreme dryness of the spring months—February, March, and April. This excessive dryness was felt more or less throughout the entire country, but most severely, as might have been expected, in the eastern counties, which at no time receive so much rain as those on the western borders.

July, again, a month that is generally remarkable for heavy showers, was, last year, a singular exception to the general rule. The largest amount recorded during that month was 1.5 inches, at Liverpool, an amount which has frequently been exceeded during a single storm in other years; whilst the least amount is that returned from Worthing, and is represented by 0.4 inch.

From August to the end of the year the fall throughout the country was very much of an average kind, and if it had not been for the extraordinary deficiency during the spring, the year's total would have shown a fair average.

The effect of this spring defect on the yearly amounts will be seen in the following statement:

STATIONS.	Fall for the whole year.	Average fall.	Difference from average.
	inches	inches	inches
Guernsey	35.9	33.0	+ 2.9
Bournemouth	30.3	33.0	— 2.7
Little Bridy (Dorsetshire)	38.7	35.0	+ 3.7
Worthing	28.3	32.7	— 4.4
Greenwich	20.0	25.6	— 5.6
Oxford	22.4	27.1	— 4.7
Bedford	17.3	25.0	— 7.7
Norwich	18.8	23.0	— 4.2
Grantham	19.6	24.0	— 4.4
Liverpool	29.2	25.3	+ 3.9
Leeds	30.5	24.0	+ 6.5
Otley (Yorkshire)	30.4	23.4	+ 7.0
Culloden	33.0	29.0	+ 4.0

We have interpolated values for the months for which we had not the returns. The year results, therefore, for Bedford, Leeds, Otley, and Culloden, are liable to some slight error; although it is believed that they do not differ very much from the truth.

From an inspection of this table, it appears that whilst some places, both north and south, had, on the average of the whole year, an excess of rain, that part of the country included between the latitudes 51½° and 53½° suffered a defect of moisture to a considerable degree. Greenwich and Bedford being as much as 5.6 inches and 7.7 inches, respectively, below their averages.

More north, however, the case is different; and, instead of showing a deficiency, the yearly total of our four northern stations, Liverpool, Leeds, Otley, and Culloden, exhibit an excess—at Leeds and Otley of as much as 6.5 inches and 7 inches respectively. This would make the mean fall for the whole country, deduced from the thirteen stations, rather more than five inches below the average; but these places hardly express the mean of the country.

In the above table the sign (+) is to be read *higher*, and the sign (—) *lower* than the average.

THE PRESENT POSITION OF THE BRITISH FARMER.

BY A PRACTICAL FARMER.

The political horizon is becoming more clouded and complicated than for some years past. The times look very eventful; the issue none can tell. The boasted ninety days in which the American "rebellion" was to be quelled, have long passed away; and the woful strife of brotherhood is as rife and destructive as at the commencement. There is no cessation of bloody warfare, nor any appearance of a return of a more kindly feeling between the contending States. It may last for years, unless intervention is determined upon; and really, to take a homely view of the case, it seems very hard for me to suffer so sadly because my neighbours, who are all of one family, will quarrel and fight. I see no prospect that my older neighbours will ever obtain the mastery over their brethren; and although they threaten to give me a good dressing if I interfere, yet I am getting so short of shirts and bed-linen, to say nothing of my wife's garments, pillow-covers, &c., which I used to buy of my younger neighbours, that I am inclined to commence dealing with them again, in spite of the threat. Besides, I believe if I did come to this decision, it would pretty nearly end the quarrel, and compel them to come to some terms, either of amity or "to agree to differ." But suppose you did, and your neighbour did commence castigating you—what then? Why, it would put me to a very considerable expense to defend myself and prosecute my neighbour for the assault. I must ultimately, however, succeed, and I should derive all the benefit I desire to secure; and I think it worth the trial, as I can see no end to the bad feeling. They want to divide their business, and why should *they* not? Well, I can buy my breadstuffs of one, and my cotton goods of the other. And why should I not? Dropping this simile, I do say there is an end to forbearance in a Government as well as in individuals. It is a matter for most serious thought for our statesmen. Are we, in this country, to sacrifice a vast manufacturing population because of the internal and interminable quarrels of a country with whom we were at peace? The strife has lasted already too long. It is high time it were put down.

Well, but America is not the only cause of uneasiness: all Europe is in commotion; Russia and Poland are still in a most cruelly hostile state; the Poles are exiled by thousands. Then all Germany, Austria, Prussia, and Denmark are under great political excitement and upon the very eve of war. Where is all this to end? France, England, and the rest of Europe are anxious spectators. That well-known test of public opinion, the money market, is in a most critical and feverish condition; money has seldom been dearer. The Bank of England charges for loans £8 per cent. interest. Verily the political atmosphere is in uncertain gloom; the social prospects unsatisfactory and hazardous. What are farmers to do, and what then is their position? Let us see: They have been blessed with a bounteous harvest; the imports from abroad have been moderate; they have had a high price for their stock and wool, but a low price for their grain; hence their business position would be about an average one. The past three years of business were to them unremunerative; the present is an average business year. The winter has been, thus far, exceedingly fine and favourable, and, although they have not made good the losses of previous years, yet their present position is encouraging, and should peace be continued, plenty will abound. We take, then, the present position of the farmer to be a favourable one

as respects his business. We also desire to show his position politically and socially considered. Compared with other countries he pays heavier taxes, and is subject to, and has to contend with importations, under very disadvantageous circumstances; he pays higher rents, higher tithes, higher rates and dues, higher wages, and higher household expenses, and yet has to compete with foreign produce coming from countries possessing more suitable climates, but paying neither rent nor taxes; and others where all outgoings are trifling, and where the habits of the people are simple and inexpensive; others where wheaten-bread is held to be a luxury; others where the soils are inexhaustible and cultivation scarcely requisite; and others where it is only necessary to sow and then to reap, without cultivation. What British farmer can compete successfully against odds like these? And yet such are well-known facts, as witness against us the vast prairies of America and of Canada, the vast tracts of Southern Russia, of Poland, Hungary, Prussia, and Germany, of Egypt, and parts of Asia. What can the British farmer do but to oppose every kind of agricultural improvement against such formidable (I had almost said unjust) competition? This he does do, this he is compelled to do, in self-defence. What then is his true position? and what are his prospects? His true position is this: He is blessed with a country at peace with all the world, and ruled upon the highest principles of right and equity. He, therefore, may use his best energies, his experienced judgment, skill, and capital, without hurt or hindrance, relying upon a sure and certain market for his produce, subject to the competition already named, but which his better knowledge, and the application of scientific aids, in culture, in manures, in foods, in the production of crops of corn and of roots, and in general management, together with the knowledge of stock and the profitable fattening thereof, will enable him to meet. In this way only can he now profitably compete with imported produce. For this purpose every facility that a nation can give to his unprotected industry and energy ought to be accorded to him; but instead of this, he is made to provide for the ecclesiastical polity of the country; he has to provide highways for the country; he has to feed the poor of the country—these are chiefly laid on land—besides bearing a large share in the general burdens of the kingdom; one in particular is very unique and oppressive—the tax upon his produce, *i. e.*, his barley when malted. In this item he nearly stands alone as a taxed man. I know of no other tax upon raw produce equal or analogous to it. Such an anomaly ought to be dashed from the statute book. What a hard tax upon the poor man's beer!!! It is unjust! It can't be spared? Then lower it very considerably. The extra consumption will pay the balance. No trifle will do it: it must be sufficient to permit the malting of inferior barley. In short, the farmer's position, as shown above, is not equal—he bears unequal burdens, he pays unequal taxes. This is unfair, and a direct injury and hardship. At all events, if he has so much to meet he ought to be free and unfettered to enable him to do so. But what are his prospects? Corn is low, particularly low qualities of barley; wheat is dear; stock is high, pork excepted; wool is dear; all Europe in commotion; American affairs as bad and unsettled as ever; money scarce and dear. An European war (which we pray Almighty God to prevent) would, in some measure con-

hance the price of corn for a time; Austria, Hungary, parts of Germany, and Prussia would cease to supply us; cattle and sheep would still come from Denmark and the neighbouring countries usually sending to us; but a few from Holstein, Saxony, and some of the minor German provinces would be held back. Apart from this, the horrid hubbub of war, with all its exciting interests, and all its momentous objects and uncertainties, will have wonderful weight, according with the successes or disasters of the contending countries. But be that as it may, the difference in the amount of importations from these countries will not suffice of itself to make any material alteration in the price of either corn, cattle, or sheep. Political considerations and the complication of affairs may make a

great alteration in prices, and consequently in the position and prospects of the British farmer, but it does not necessarily arise out of the present state of Europe. The farmer has to depend upon himself, amidst the din of strife; and I would diffidently counsel a steady cautious course. There is no occasion for alarm, nor is there any good ground to suppose any considerable alteration, either for better or worse, as likely to arise out of the unsettled state of Europe, nor can we expect any alteration in affairs dependent upon American influence till their differences are adjusted, of which we have no immediate prospect. The great thing then to take place is the introduction of cotton, to the displacement and consequent cheapening of wool.

LONG-WOOLLED SHEEP IN NEW ZEALAND.

The attention of some of the Australian colonies is being actively directed just now to the rearing of long-woolled sheep. This is a subject on which we have already written for general information; but there are some further points deserving of notice. The colonies where long-woolled sheep may most advantageously be raised would seem to be Western Australia, Tasmania, and New Zealand, although parts of the other colonies may prove also well adapted to these kinds.

It is now beginning to be seriously mooted by many of the colonial sheep farmers whether they would not be more amply remunerated by ceasing to cultivate so ardently the finest-woolled sheep, which by interbreeding have dwindled into the very dwarfs that return nothing to their possessors but the minute although fine jackets they yearly strip from their backs, and by adopting a breed instead, of hardy large-framed animals that would produce fleeces as remunerative, or nearly so, as those of the present merino, and carcases that would provide the increasing population more abundantly with meat.

The produce of sheep, the lambs of pure merinos by Cheviot rams, are large-framed well-formed animals. These sheep have yielded an average of wool per fleece of four pounds, which has realized in England 2s. 2d. per lb. Some large shipments of these Cheviot-merino sheep have been made to New Zealand; and in proof of their value Mr. James Stewart, of Symmon's Plains, in writing to Dr. Grant, who first introduced the Cheviot sheep into Tasmania, states that a thousand two-tooth ewes and wethers of this class, when sold after shearing, produced him more than 10s. per head, showing that these yearling sheep, and their wool added together, realized 18s. 4d. to 18s. 8d. per head, which is more than fine merinos will do. Moreover, he adds, I have sold fat wethers, two years old, the same breed, which were much admired for their size, symmetry, and weight, and although a very dull sale, they brought me 15s. per head, when other fat sheep only realized 9s. to 10s. per head.

The Wool Supply Committee of Bradford, who are well acquainted with the varieties and properties of New Zealand wool, have long held it in high esteem, and believe the colony of New Zealand to promise more than any other a future large supply of long-stapled fleeces of a medium quality and length, between the fine merinos of Australia and the long-grown Leicester of this country. In a recent letter to Dr. Curl, a large wool-grower of Canterbury, they state as their opinion that if the sheep farmers of New Zealand could make any useful change in the cultivation of their flocks, it would be in aiming less at producing fineness of hair and more at obtaining length of staple, and by a less liberal introduction of merino blood

on occasions where the blood of some of the deep-stapled sheep of England might secure a more valuable stock, and produce a fleece better adapted to meet the growing wants of the manufacturers of this country.

For years past the relative values of long-stapled coarse wools and short-stapled fine wool have been undergoing a change in favour of the former. For example, the long-stapled wool grown in Yorkshire, Leicestershire, and other English counties, is now selling at a higher price by 50 per cent. than it realized five years ago, while the fine merino wool of Australia is not more than 5 per cent. dearer than it was at that period. And unless some change speedily occur in the market, it will soon be found that while the finest wools of our own colonies sell at a lower price in 1864 than in 1863, the long-stapled coarse wool, possessing good combing properties (namely, long, sound, and free in the staple, that is, the hairs easily separable) will be eagerly sought after at improved rates.

While it is not denied that changes in taste and the caprice of fashion have possibly contributed in some manner to produce these results, it is nevertheless maintained that there are causes in operation which tend materially to ensure a more profitable market for wool of good combing length than for any of the shorter stapled wools of the pure merino breed. While the consumption of all classes of wool has for years past gradually increased, the production of long-stapled wool has increased only to an inappreciable extent, if indeed it can be said to have increased at all. All the new sources of supply—Australia, Tasmania, South Africa, New Zealand—furnish fine, soft, useful, short-stapled wool. Great Britain, with a limited area, continues to retain the production of deep-grown wool almost entirely to itself. Practically it may be said to have no competitor. It cannot extend its surface, and is never likely to increase its numbers of sheep rapidly. On the other hand, the demand for long-grown wool increases year by year, and any country which possesses facilities for the production of a wool endowed with qualities which are peculiar to wool of English growth, seems far more likely to ensure a profitable market for its commodity than it can do by adhering to wool of a shorter and finer type.

To practical men it would be superfluous to urge the greater weight of wool grown by each individual sheep, as an additional reason for aiming at length of staple and good combing properties, in preference to fineness and softness of hair.

The increase of sheep in New Zealand is most significant as an indication of advancing wealth. In 1851 the total number of sheep in New Zealand was but 233,043. In 1853 the number was 1,528,324, while the last census

showed the number in December, 1861, to have increased to 2,760,188, and since then there have been large imports from Tasmania, Victoria, and Sydney, besides the natural increase. The progress of that very important resource of the colony—wool—has been scarcely less remarkable. In 1861 the value of this export, calculated at the uniform rate of 1s. 4d. per lb., was £523,728. In 1853 the total value of the wool exported from New Zealand was only £66,507. Year by year since the export has gone on with rapidly increasing progress, until we find in 1861 a clip attained for that single year, which comes within a few thousand pounds of the aggregate amount of the totals of the five years 1853-57 taken together. If we had the complete returns for the succeeding two years, we should find an equal if not greater advance made.

The late large importations of sheep into the islands must, with the natural increase of the flocks, considerably augment the future clips, and will in a few years give New Zealand an export of wool equal to New South Wales, or probably as great as that of Victoria. Sheep have been taken over to Lyttelton from New South Wales, in batches of 8,000 or 9,000 at a time. Thus Mr. Robert Tooth, in 1862, engaged the White Star, one of the largest sailing vessels in the world, to transport 50,000 merino sheep from Sydney. They were placed in four decks, in pens, in lots of 25 to 30, and fed on the voyage of ten days to a fortnight on hay soaked in water. The loss was comparatively small on the several trips made. This enterprise is another illustration of the facilities for extending to new countries the advantages possessed by the older colonies. When New South Wales first introduced sheep it was by tens; and it required years to raise a single flock: now by a single vessel—making voyages averaging fourteen days—fifty thousand ewes are, in a few months, removed from one colony to another, as far from each other as England and Constantinople. There are other islands still nearer the line, and where flocks of sheep already exist: at Fiji they are said to do well.

Mr. Rich, of Mount Eden, Auckland, devoted great attention to the introduction of improved breeds into New Zealand. He recently sold at Canterbury a most valuable flock of about 1,300, having given up sheep-farming owing to the disturbed state of the northern island, and retired to England. The Spanish merinos were of ancient and pure blood, the fleece remarkably fine, very closely set, and of great weight. The clip of the ewes varied from 7 to 11 lbs. of wool for twelve months' growth, and of the rams over 15 lbs. each in the grease. The French merino ewes averaged 10 lbs. A flock of thirty rams and ten ewes of the true Negretti breed from Wiesin in Mecklenburg was imported in the close of 1861. The average produce of the flock where they were selected was from $3\frac{1}{2}$ to 4 lbs. of clean washed wool from the ewes, and from 7 to 8 lbs. from the rams. The quality of the fleece, the length, fineness, and evenness of the staple, are such as to have obtained for a long period an average price of 3s. per lb. The average weight of good quality Port Phillip washed is from $2\frac{1}{2}$ to $3\frac{1}{2}$ lbs., and of the Sydney fleece $2\frac{1}{2}$ lbs.

While speaking of the weight of fleece, we may incidentally remark that in South Australia some attention appears to be given, and with success, to Leicesters; for we find Mr. James Rankine, in the late Adelaide papers, calling attention to the weight of some fleeces from his sheep aborn in the end of September in the southern parts of that colony. The following are the particulars—

No. 1. Leicester ewe, seven years old; has produced nine lambs within the last three years. Weight of fleece, 9 $\frac{1}{2}$ lbs.

No. 2. Leicester ewe, six years old; has been well kept. Weight of fleece, 14 $\frac{1}{2}$ lbs.

No. 3. Leicester ram, about same age as No. 2. Ran

with the ewes six months of past year, and during that time was badly kept. Weight of fleece, 13 $\frac{1}{2}$ lbs.

No. 4. Leicester ram. Ran four months with the ewes; not well kept; 14 months old. Weight of fleece, 11 $\frac{1}{2}$ lbs.

No. 5. Leicester ram. Same age as last, and treated in same manner. Weight of fleece, 12 $\frac{1}{2}$ lbs.

No. 6. Leicester ram, same age as last, but well kept. Weight of fleece, 17 lbs.

No. 7. Leicester ewe, same age as above; well kept. Weight of wool, 15 $\frac{1}{2}$ lbs.

No. 8. Southdown ram, six years old. Ran with the ewes greater part of the year; not well fed. Weight, 9 $\frac{1}{2}$ lbs.

Nos. 9 and 10. Twins. Got by Leicester ram out of three-quarter Down ewe; 14 months old. Well-formed animals, and wool of excellent quality. Wool, 13 lbs. each.

No. 11. Cross-bred Lincoln, or Leicester and Merino ewe; one of a pen exhibited at Adelaide show of last year by Dr. Browne. Well fed. Wool, 9 lbs.

The fleeces were in each case weighed in grease, and it will be observed that they were chiefly Leicesters, the exceptions being one Southdown, one Leicester out of a three-quarter Southdown ewe, and one cross-bred Lincoln, or Leicester and Merino ewe.

We republish the following further practical hints of the Bradford Committee: "Nearly all that the Committee can do is to lay before wool growers a knowledge of the wants of commerce, and leave each man to determine how far he can supply those wants, and at the same time exercise a due regard to his own profit and advantage. Whether the improvements suggested be attainable in the character of New Zealand wool or not, the wool producer must judge, and if they be attainable he must exercise his own discretion in the adoption of the necessary processes for the fulfilment of his wishes. The Committee learn with great satisfaction, that the area of cultivated grass land is on the increase, as upon that they believe depends, to a large extent, the supply of nutritive provender necessary for the support of long-wooled sheep—the herbage in such case being available without the risk of exhausting the animal, by its being compelled to range over a great extent of country, in order to obtain a sufficient supply of food. An improvement may be made in the classification of some flocks of the New Zealand wool, and if greater care were exercised in having the combing and clothing fleeces packed in separate bales, and especially in keeping a greasy or unwashed wool entirely to itself, it would save much trouble here and be of advantage to the colonist. The fraudulent practice of packing two or three, or even more, unwashed fleeces in the centre of a bale of clean or washed wool, has sometimes been productive of considerable loss to those whose wool has been honestly packed. When the tide of suspicion once sets in, it is easy to understand that it may run into excess, and the reputation for petty frauds in packing, which are sometimes discoverable in wool from New Zealand, has undoubtedly been a disadvantage to the entire colony. It is possible that dealers and shippers are more at fault in this matter than the growers are, but in any case the frauds themselves, on every ground, merit the condemnation of all honest men."

It is for the colonists to determine what use to make of the hints the Committee have given. Taking the various styles of wool at present imported as a criterion, we agree in the opinion that New Zealand is better adapted than any other colony to produce a wool that will rival some of the most approved British flocks in the production of a certain class of combing wool, and believe that it will be to the interest of the colonial flockmasters to develop the capability of their country.

PORTABLE FARM RAILWAYS.

A meeting of the Maidstone Farmers' Club was held at the Bull Inn, on Thursday evening, the 21st January. There were present Messrs. C. G. Whitaker (in the chair), Beard, sen., Bridgland, sen. and jun., Buckland, sen. and jun., Cogger, Day, Dawson, Grant, T. and F. Hayes, Marks, Pack, J. and H. Paine, P. S. Pannett, Reeves, and Stonham.

The business of the club having been disposed of, Mr. GRANT read an interesting paper on the Origin and Progress of Portable Farm Railways. He said—

Mr. Chairman and gentlemen, the subject which I have the honour of introducing to your notice this evening is that of portable farm railways as a substitute for field carting. It is a subject of which very little notice has hitherto been taken, and which is still less understood, although I believe it to be one of sufficient importance to rank next in order to land draining and steam cultivation, to both of which it is the fitting auxiliary, without which the advantages to be derived from them must ever be incomplete. It affords me great satisfaction to see so large an attendance of members, for I hope and believe that the ventilation of the subject at this meeting will exert an influence beyond the limits of this county, as the opportunities which many of you have had of seeing my apparatus at work in this neighbourhood, and two of you on your own farms, have given you a practical knowledge of the subject far beyond that which most farmers in other districts possess; in fact, far beyond that of which the great majority of the members of the Royal Agricultural Society can boast, for they have not as yet had the advantage of witnessing a working trial, which I have exerted myself in vain to procure. By way of opening my subject, I will endeavour to give you some idea of the past history and present position of portable railways, respecting which I have lately had good opportunities of gleaning information, although two years and a half ago I knew as little about them as any man in this room. In 1854, letters patent were granted to Mr. Crosskill, of Beverley, the great inventor of improved carts, waggons, and other farming tackle, for "improvements in the construction of portable railways," which implies that others then existed, although I believe they were little used in farming operations. Since then, however, a great many sets of Mr. Crosskill's manufacture have been sold, numbers having been sent abroad to countries where the scarcity of roads renders tackle of the kind peculiarly valuable. Of those used in England some have been employed with very great advantage in getting root crops off wet land, for which operation anything in the nature of a railway must be infinitely preferable to the dung cart. Others have been employed in conveying manure, lime, &c., over wet land; but I have not been able to ascertain satisfactorily to what extent they have been conveniently laid for spreading. Thinking it may interest many of you as hop growers, I do not know of any other portable railway having been manufactured for sale for farm purposes except Crosskill's and my own; but I have heard of several different kinds being used by gentlemen, chiefly amateur farmers, who have had them made according to their own notions. I well remember one gentleman in particular informing me at the Battersea Show, in 1862, that he had made a practice for ten years past of clearing off his roots by rail, by means of straight lines, all converging to a point at the clamp, and of course getting very wide apart at the further side of the field. Having told you what I know of other systems, I now come to my own. It was about two years and a quarter ago when the idea of a portable railway first entered my head, being forced upon me by the difficulty I found in clearing my root crops off, and getting my manure on, my wet fields. I did not then know that such a thing as a portable railway existed anywhere, which I believe afforded me all the better chance of hitting upon new ideas; at all events, I certainly did hit upon a few, and worked hard at them until June, 1862, when I secured them by a patent. The rails and trucks which I then exhibited at the Battersea Show had never been worked, and were with difficulty completed in time for exhibition, my only objects being to ascertain what would be thought of them, and whether the principles involved

in them were original inventions. I, however, received one order for a pair of trucks, and 500 yards of rail, which I sent to Amsterdam, and I have since heard they are working well in coal sheds. Amongst the trucks exhibited were a pair of harvest trucks, designed for carrying the wheat and other harvest crops either to the barn or the stacks in the field. On my return from Battersea I pushed on my manufacture, and in November following I performed my first work, partly by manual and partly by horse power. It consisted in carrying out dung over a piece of hop garden, which could only be reached by crossing over another intervening piece. The saving of damage to the ground, particularly to the intervening piece, was so immense, and the work altogether so successfully performed, that I was sufficiently encouraged to issue forthwith a number of circulars to farmers and others in the neighbourhood, and the editors of the local press, to witness my next operations of getting off my root crops and manuring a field, at which many of you were present, and which were very fully described in the newspapers. Although many difficulties were felt, which have since led to many improvements in the tackle, the work on the whole shewed a very large profit, when the damage which carting would have inflicted upon the soil, in the then wet state of the ground, is taken into account, although, from imperfections in the tackle, and unskillfulness on the part of the men, the actual working expense was a trifle more than carting. I soon after cleared off 468 tons of stone lying scattered over a piece of woodland, which Mr. Rayfield recently grubbed, on the further side of his hop-garden at Tovil. I carried them across the hop-garden by manual power, a distance of a quarter of a mile, without a frost, but without injury to the ground, and at a much cheaper rate than carting, to the great satisfaction of Mr. Rayfield, who well knows that the stones must have remained where they were till this winter, had I not moved them, and so enabled him to grow, as I believe he did, a good crop of potatoes on his fresh ground. My trucks next assisted in emptying a great quantity of mud out of the large pond in Mr. Whatman's park, where a great many men with planks and barrows were simultaneously employed at the same work. Nothing could be plainer to a looker on than the immense superiority of the rails and trucks over the planks and barrows, both as regards economy and despatch. The rails were next laid across a meadow to some clay pits, a distance of about a quarter of a mile, where carts would not have been allowed to pass, on account of the damage they would have inflicted, but must have gone upwards of a mile round by the road, which passed over a steep hill; but both distance and hill were avoided by the rails. A large quantity of clay having been thus obtained for repairing the pond, the rails and trucks were next employed in carrying out about 2 000 cubic yards of the mud on to a much higher level entirely by manual power and laying it in small lumps over the grass land of the park, at convenient distances apart for spreading, after the manner of ordinary field carting. A great part of the mud was thus conveyed a distance of half a mile; and during the progress of the work, at the longest distance, Mr. Whatman directed his horses and carts to work one whole day against the rails, with the view of testing the difference of expense, which was most carefully noted, and was found to be 1½d. per load in favour of the rails. A second trial, publicly announced, was afterwards ordered, at a shorter distance (about a quarter of a mile). This was severely contested, and resulted in a victory by the rails to the extent of 4d. per load of 12 cwt. On this occasion the incline was much greater in proportion to the whole distance, which was much against the rails. I believe also that the use of horse instead of manual power for drawing the trucks would have shown a much greater saving to the rails. The details of these trials, certified by Mr. Whatman, were published in the newspapers, and will be found in my illustrated catalogue. The chief advantage to Mr. Whatman, however, was not the saving of expense, but the preservation of the turf from being cut about by the carts, and I might almost add getting the work done as all before the return. The rails were next employed in carrying out 160 cubic

yards of manure over Mr. Dawson's hop-garden, at Bearsted, after the hops were poled. This work was expeditionally performed by two men only, without injury to the bine or the soil, at the moderate charge of 4d. per cubic yard. Mr. Dawson will tell you, as he has told me, that he was unable for want of a frost to get the dung in the winter, and that without the rails he could not, or at least would not, have moved it until this winter, in which case it could have had no share in producing the very excellent crop of hops with which Mr. Dawson was favoured. The rails were next employed by Mr. Punnett, at Chart Sutton, in carrying out 300 cubic yards of dung for turnips, over a fifteen-acre field, at a time when, from the wet state of the weather, it would have been impracticable to have carted it on the land at all. Mr. Punnett's intention was to have ploughed it under immediately, by means of his steam plough. The ploughman at first quite expected to have to stop his plough, in order to allow the branch line, running very close and parallel to his furrow, to be moved out of his way; but he soon found out his mistake; for although the rails were worked entirely by manual power, and three men only were employed, one of whom did nothing but load the trucks, they soon left the plough far behind. I ought, perhaps, to mention that the plough was a single furrow one, and was much impeded by the wet state of the soil, which did not materially affect the working of the rails, as you may infer from the fact that the two men got out in one day 56 cubic yards of the manure. Besides going to and fro with the trucks, and assisting the other man in loading them, the two men shifted, as part of their day's work, 224 pair of rails—that is half a mile and 44 rods of the branch line—not to mention the turn-table, and a small piece of the main line. Mr. Punnett also employed the rails in applying dung for the summer dressing of hops, in which work, the incline being steep, the trucks were drawn by horse power. Some farmers refuse to see any advantage in the work done for Mr. Punnett, on the ground that they prefer dunging for turnips in the winter; but I shall be glad to know how that could have been done last winter without either the use of rails or serious damage to the soil. Having performed the various works I have described satisfactorily to my employers, I took half a mile of rails, a number of trucks, and the four men of Kent who beat the horses at up-hill work in Mr. Whatman's park, with me to the Royal Agricultural Society's Show at Worcester, and exerted myself most strenuously, but in vain, to obtain a working trial before the Society. In spite of the great disadvantages the rails were under of being seen piled up in the implement yard, instead of being at work in the field, and without having been tested by the judges of the show, they nevertheless attracted much attention from the visitors, and drew forth the following notice in the official journal of the Society, under the heading of—

"REPORT ON THE WORCESTER SHOW-YARD.

"Among the agricultural articles exhibited which belong to no definite class, none have more of a growing interest than the portable farm railway. As steam-cultivation advances in clay districts (in which materials for road-making are so often wanting), and superfluous horses are sold off, horse-labour will have to be economised, even at a slack time of year. Moreover, the steam-cultivator will here help you to grow, but not to remove, large crops of roots. With the ordinary farm track, as the traffic increases, the difficulty of transport is augmented in a very much higher degree, until it becomes insuperable; whenever, therefore, the common cart or waggon is again under review, such a substitute as the tramway truck and its movable road may deserve special attention.

"Mr. Grant has made praiseworthy efforts to reduce the movable railway to its most simple elements: his continuous gearing upon the ground, his simple joint from the insertion of a projecting iron tongue on one rail into the iron mouth of the next, and, lastly, his plain iron tie instead of a sleeper, are points which enable him to perform with much ease and despatch the removal which the branch-line of a farm railway must be constantly undergoing. But it is questionable whether his system is not rather a substitute for the barrow than the cart—whether horse traction can be well applied to it (and this is essential to economy), and also generally whether it is on a sufficiently large scale to be suited to the farm. It is satisfactory to know that its merits will be noted by an active agriculturist, who is prepared to make the

venture, which involves an outlay of about £70 for a quarter of a mile, £110 for half a mile of rail, with trucks, turntable, &c.

"N.B. The outlay is not quite correctly stated."

In reply to the first query in the above report, whether my system is not rather a substitute for the barrow than the cart, I appeal to the amount of work done to the displacement of carts both before and since the Worcester Show; and my best answer to the second query, respecting horse-traction, is the fact that the identical rails and trucks which suggested the doubt have, since their return from Worcester, been almost incessantly at work by horse-power. They went straight from Worcester to the Earl of Romney's park, where they remained idle until the end of August, on account of the difficulty of getting men during harvest. They were then employed in carrying out earth by contract over the grass land, and were worked so successfully by horse-power as to yield me a profit, and also to earn the following testimonial from his lordship's agent:

"The Mote Park, Maidstone,
6th November, 1863.

"DEAR SIR,—I have great pleasure in stating that the removal of upwards of 1,500 yards of earth in the Mote Park by means of your portable rail has proved very satisfactory, and at much less cost to Lord Romney than if the earth had been carted wholly by horses in our usual way.

"I must also remark on the great advantage of using horses with your trucks, especially where the ground is much on an acclivity, which was the case here, and I could but observe the very efficient help which horses gave in this instance,

"I am, dear sir, yours faithfully,

"FREDERICK WALKER,
Agent to the Earl of Romney.

"Mr. John Grant, Linton."

From the Mote Park the tackle was conveyed to the Kent County Lunatic Asylum, where it was also employed by contract in conveying 550 solid cubic yards of earth a distance of half-a-mile, over arable and meadow land, for the purpose of forming a mound in one of the airing courts of the patients. A small nag horse, worth about £8, altogether too weak for carting, drew from two to three cubic yards of loose earth up hill, and trotted back with the empty train at the rate of about eight miles an hour. In this instance, at least, I had the satisfaction of finding that time saved is money earned; for, when the work was finished, I found myself the richer by a clear profit of £8 (the value of the horse employed), after paying all expenses, and allowing for wear and tear. By means of the rails, this work was performed at a time when it could not have been done at all by ordinary carting, in consequence of the hard road being broken up by drainage works in progress. From the Asylum the tackle was at once removed to the College hop-gardens, where it is still at work, and has already carried out upwards of 900 cubic yards of earth and mixed dung and earth, up hill, by horse-power, an average distance of nearly half-a-mile, the cost applied being thirty loads to the acre. The old College-ground yet remains to be done, at the rate of twenty loads to the acre, which thin coat will afford a fine opportunity for some of you to witness the rapidity with which the rails can be shifted; for, like the work in Mr. Punnett's turnip-field, every yard carried out involves the shifting of four pairs of rails. This hop-garden work has been going steadily on before, during, and since the frosts, always alike satisfactorily. It is true, the manure might, by extraordinary efforts, regardless of expense, have been carted out during the late frost; but the rails could have done far better than that—they could have carried out one large and valuable mixed last winter, which has remained idle, or rather kept wasting, until now, on account of the supposed impracticability of getting it on the land before. As it is, I believe the rails will effect a saving in expense to Messrs. Simmonds and Hunt of at least 3d. per cubic yard as compared with ordinary carting—my charge being only 6d. per yard, which, as far as I can see at present, will about cover my expenses. I hope that the story of the work done has not wearied you, and that it has convinced you that the employers of the rails have in every instance derived more or less advantage from their use. The wages of the men employed—3s. a-day—will, I think, bear comparison with the average earnings of farm labourers in this or any

other district; and I think you will own that, as ratepayers, you can have nothing to fear from portable farm railways, whether as affecting paperism or the wear and tear of the roads. Nor do I shrink from regarding the subject from a national point of view. Mr. Mechi informs us, in his book, "How to farm profitably" (page 210), that farm horses consume nearly one-fourth of all the arable land in the kingdom. Since this book was written, steam cultivation has done something to lessen the evil, but not without feeding in a proportionate degree upon the very vitals of the kingdom—I mean its coal. Portable railways are open to no such objection; the saving they effect is a clear saving; and, in a national point of view, it is impossible to conceive economy more perfect or unalloyed than that which the use of portable farm railways affords. It does not consist in the creation of any new power, but simply in the use of one great existing power which has hitherto been thrown away by the British farmer, and in the avoidance of another great obstruction which has hitherto cost the British farmer millions of money annually to

overcome by main force. I need hardly say that the great power is "gravitation" and the great obstruction "friction." If the use of portable farm railways ever raises the price of anything, it will be the bone and sinew of the farm labourer, which can hardly be considered a national evil; and as for the farmer, if he has to pay his men more, he will be doubly repaid in the reduced expenses of his stables.

In the course of his address, Mr. Grant exhibited and explained one or two recent improvements effected in laying down the rails. Previously they were coupled by an iron bar let into some castings inside the rails, and great inconvenience was experienced when trucks were drawn by horses. This has now been entirely done away, the coupling-irons being placed under the rails, thus forming a kind of sleeper, leaving a free passage between the rails for horses. Mr. Grant also explained the system of laying down the rails, and the simplicity of connecting the various lengths.

A cordial vote of thanks was given to Mr. Grant at the close of his address.

ALTERED TILLAGE AND ROTATION IN REFERENCE TO THE GRUB WORM.

On Monday, the 11th of January, a meeting of the Fettercairn Farmers' Club was held to discuss a paper on this subject, as a sequel to Mr. Scroggie's paper on the ravages of the grub. There was a large attendance of farmers. Colonel M'Inroy was called to the chair, and Mr. JOHNSTON, of Cairnbag, read the following paper: When we last met to gather information regarding our common enemy the grub, we are assured all those present could not fail deriving benefit from the instructive paper then read, along with expressed opinions and suggestions from amongst the audience. In our conversational discussion, not a little conflicting testimony was adduced, so much so that from our united experience no reliable data were attained that held good under all circumstances. We learned that early ploughing in one case proved very much a preventive; in another, it entirely failed; instances were given of the blight from seed of crop 1861 resisting grub ravages, at least escaping destruction; while in another, the produce of old seed was consumed; while that from new (of crop 1862) suffered little, even where sown adjacent. The one remedial expedient regarding which all seemed to agree was reduction of the furrows by thorough harrowing, both before and after sowing, followed by consolidating the soil with a heavy roller, in the fond hope that our tiny foe might find it impossible to ascend through it, because made resistant against his natural propensities; and thus, while admitting our powerlessness to cope with him in open field, we may form an earth-work that will serve our purpose, restraining him within it, in expectation that, if not starved within his retreat, such a hindrance will be thrown in the way of his maturer development that, according to the well-known law of animal, and we infer insect life, when passing from the embryo stage to a higher one, the functions engaged in such operation being disturbed, there necessarily follows an abortion. We offered the suggestion that a change of rotation in cropping was likely to prove advantageous, because, if carried judiciously out, not likely to give an inferior return in our balance-sheet—a circumstance not without weight in our minds, because producing actual weight in our pockets. When, having made this suggestion, you kindly proposed that the next discussion on the subject should be opened up by a paper from myself on changed rotation, my reluctance was great in introducing such subject before the intelligence of so many, with whom rotations, various, are so well understood. My scruples have in a great measure been got over in the thought that such paper can only be expected to contain suggestions—the exhaustives, we trust, will flow from the variety of opinion expressed in the subsequent discussion. Having been gathering additional information since our last meeting, you will pardon me taking a little more liberty than proposed, in recommending other remedies along with change of rotation. How, then, are we to contend with the grub-worm? Perhaps there are few professions in which more patient perseverance and indomitable energy is needed than in that to which most of us belong. The primeval decree—"Thorns also, and thistles, shall it

bring forth to thee"—intimates that it is not in indolent supineness we are successfully to battle with these; but in the exercise of mental activity and reflection, as well as by the sweat of our brow, are we to contend against—yea, overcome—the manifold oppositions which on all sides rise up against us, and of which, doubtless, the "thorns and thistles" are given as expressive samples. It is well that causes arise to call forth the energies of man; difficulties, unless they existed, would never require surmounting; and it is because of these that in this busy and energetic age we have all ranks and professions joining their quota to emancipate ours from the many prejudices that empiricism had wrapped around it, and give it a place and rank among the other sciences. Keeping this in mind, let us ever retain as our motto "Forward." Let us not give up our energies and hopelessly look on in apathy at this new "thorn" we are called to combat; but uniting our experience, and hailing every reasonable suggestion from each other, put our shoulder to this new wheel of difficulty, and, like others before us, may we not expect to turn it too? The serious loss which has been sustained in this county, not to speak of others, is sufficient to invite redoubled energy and appliances towards ameliorating the ravages of, if not entirely overcoming and annihilating, the grub-worm. In our suggestions, we would notice poisonous and mechanical agencies, as already hinted at. We know it is true, in regard to the development of vitality from one stage to another, certain conditions are needed for maturing the incipient life of the animal or insect. For example, if these conditions are not fulfilled in the case of any of our domesticated animals—the mare, or the cow, for instance—have we not suffered great disappointment and loss on the premature appearance of their progeny, induced by some mismanagement on our part, interfering with the conditions necessary to the maturer development of the young life—fitting it for a new sphere of existence in due time? Take, again, the hen. We all know—perhaps the ladies have told us—that if a nest of eggs are, during incubation, deprived of the conditions necessary to the full development of the life within them—if the hen or other bird be, while hatching, hindered, when leaving for food, in returning to the nest at the time natural instinct dictates, we will invariably be disappointed by abortion resulting—the chicks won't come to maturity. These are facts with which every observer is conversant. How shall we turn them to account in our present necessity? We shall—instead of, as in these cases, using all care in ministering to favourable conditions—use every effort to disturb those connected with the grub; and so sure as we can do so to the extent of interfering with their production from the egg, so certainly shall we attain our wished-for object. Our difficulty lies in the imperfect acquaintance we, as yet, possess regarding the stages through which the egg passes until the living worm emerges from it. Could we discover when life in its feeblest manifestation is present, then would be the most probable period

for succeeding in our attempts at interfering with the conditions favourable for the increase of that life. Supposing—for we fear, with our limited knowledge, we can go no further—the period to be January or February; doubtless, mechanical and poisonous manurial appliances, such as salt, well harrowed into the soil would have a salutary effect. We proposed, last meeting, dressing in November with 10 cwt. of salt on the surface of the lea to be ploughed, believing then it would be detrimental to the crop if applied in such quantity in spring. More mature consideration leads us to abandon the proposal—first, because in November it is more than likely life in the eggs is only latent, and the salt consequently would produce little, if any effect; and, secondly, when the life in the egg is quickened in subsequent months, the salt ere then would have lost its power to destroy it, because washed and diluted by the winter rains. Instead of applying salt in November, we should suggest its application in February, to the extent of 10 cwt. per acre, harrowed well into the soil, and the land seeded with oats four or five weeks thereafter. We are happy to be able to give an actual case in point, which we trust will relieve you of all fears as to the apparent over-dose of salt in early spring. A friend of my own, who farms in Westmoreland, possesses a field that for seasons past, when broken up out of lea, was terribly destroyed by the grub-worm. He was advised last season to try salt to the extent of 8 cwt. per acre, harrowed-in early in February. He did so, seeding the field with oats six weeks thereafter. The result was a fine crop, and comparatively untouched by grub. My friend told me lately that he intends treating all his ploughed-lea similarly next spring, only he intends to make doubly sure by giving 10 cwt. of salt per acre, not degrading the slightest evil results from the application. Thus much, then, by way of poison interfering with the conditions of grub life in early stages. The success attained will be in the ratio of timeous application. Other substances may suggest themselves to other minds. We indicate salt, as being moderate in price, and, from the muristic acid it contains, poisonous in large applications. It is worthy of notice, as bringing out the value of salt as poison, that my friend gave the field referred to no extra harrowing or rolling. We need not advert here to another disturbing element in grub life, which was fully noticed in Mr. Scroggie's paper, save as an agency which a benevolent Providence uses to effect what we find so very difficult—we mean frost, when experienced in spring. We know how valuable (yes, how potent) this natural agency is in March, compared with its most intense manifestation in early winter, bearing out the idea that it is in spring months grub life is so far advanced as to be susceptible of natural or artificial agencies when applied for its destruction. We would further suggest, for attaining the same end—viz., disturbing the conditions necessary for maturing the life from the egg—mechanical applications. Among these, we would notice the thorough breaking up the surface of the lea, or, by skim ploughing, burying that surface beneath a good furrow, in hopes of consigning to oblivion our adversary. 1st: The breaking up of the lea surface. Perhaps the best way of attaining this would be that suggested by Mr. Alexander, viz., harrowing the surface of the lea, before ploughing. This can be done until the sward is quite broken up—so much so, that not only will the disturbing element prevail, but much of the broken sward will fall to the bottom of the furrow. Thus, combining in some measure the advantages from skim ploughing, let the harrowing proceed, so far at least that, when ploughed up, we shall have a fine rough, broken furrow, so exposing itself to the frost as will produce a compact (approaching to solid) body of soil. We may thus hope that conditions unfavourable like these being thrown in the way of the hatching process, a measure of success will follow. Should a proportion even after this be hatched, the condition of the soil will be such that, when seeded and harrowed in spring, it can be much more thoroughly consolidated afterwards by roller than can be effected in stiff unbroken lea furrows. Ribbing or stripping the lea, and then harrowing down the cut-up slices, as well as that part untouched by the plough, has its advocates—indeed, we were more partial to this than that suggested, until, since last meeting, learning that in a field of our own, prepared for potatoes, after this fashion, every small clod of lea-sward was infested with live

grub during potato hoeing; thus showing, we think, that the more the surface can be triturated (to use a chemical phrase), without outting up clods with it, we shall the better attain our object. Hence, we do not suggest the ribbing process, save merely as an experiment to compare with other modes. 2nd: As a mechanical disturber, we advert to skim ploughing. If it is found impracticable to attach a skim slicer to our ordinary plough (and, we fear it is so, if we want it thoroughly effected) with less than double labour, it can be very efficiently done by a plough with one horse preceding another with two horses—the first one taking only a slice of sward, say two inches thick (if more is taken, it cannot be completely buried for want of room in the furrow to hold it)—indeed, let it be just so thin as a man can cut it. This is thrown into the bottom of the furrow—the next plough following brings up a good rough, broken, furrow, completely burying the sward at a depth of five or six inches. This practice, apart from grub altogether, is common in Morayshire—at least it was so ten years ago, preparing lea for wheat in August and September. We prepared a field thus ourselves for wheat, and the crop was a very prolific one, although much destroyed in the rainy harvest of 1856. We can with every confidence recommend this skim-ploughing, done as intimated, and we certainly would have higher hopes than in any other mechanical appliance regarding results as telling against the grub. The labour is no doubt considerable, but those who have been suffering would never for a moment put the expense of some 5s. an acre in comparison with £5 an acre of loss from being eaten up by the worm. We have suggested one horse to execute this skim ploughing. We should notice, however, that when done by ourselves on the occasion referred to, we used two horses, not because the labour was too much, but because we did not care to alter the plough so as to work by one. You will observe the difficulty is to get sufficient lead on the plough. We don't see, however, that this is insuperable when one horse could easily do the work. Should the extra labour we have been claiming be grudged by any, then we would suggest simply ploughing with a strong furrow, but by all means avoiding the fine-cut slice and elevated angular corner so pleasing to the eye, yet the very style of ploughing on which frost acts so feebly, and consequently little of the soil is disintegrated, and just so little falls into the rut between the furrows, so necessary to provide a certain measure of covering, to exclude the warmth of the sun's rays in early spring, which may form one of the conditions necessary to the hatching of eggs. In the style of furrow to which we refer, we positively provide a shelter for our foe, which, with the variety of favourable adjuncts, fortify him in his stronghold, allowing him more air and sunshine than he deserves. The harrows, too, will have much more work in spring before they can disturb him in his favourable condition—consequently, he will, if hatched, live and feed securely, his food being kindly handed him in the shape of tender braird, principally growing from out the very shelter we have provided for him; for in such ploughed fields it is notorious that the corn mostly falls into the rut between the furrow slices, where he lodges; and thus he is saved all trouble of going abroad in search of it. We know his powers of locomotion are very feeble, hence the folly of having the braird growing in inviting tenderness in the very shelter where he ensconces himself. The field thus ploughed, let those who have confidence in salt, or other poisonous appliances, use such in February, harrowing them in, taking care only to harrow in line of the furrows, to secure the gathering of the application into the rut where the green sward—the home of the grub—lies. In March, seed the field, and, if possible, by a corn-drill sowing across the furrows (after the field has been harrowed flat and fine). Of all other such machines, we have seen nothing to compare with one recently brought out by Messrs. Benjamin Reid and Co., of Aberdeen, which has been successfully used last spring in northern counties. The advantages of this drill are, that it deposits the seed in rows four inches apart, accomplishing eight acres a-day with the one-horse machine, and thirteen acres with that in which two horses are required, and, in addition, saving one bushel of seed per acre. We consider the corn-drill crossing the furrows of considerable importance; for, should the grub survive the poisonous dressing, subsequent pressure from the roller may effectually retain him at a respectful distance from the bulk of the young germs beneath the surface, and he may thus be starved to death in his refuge

—at any rate, he will have more difficulty in maintaining life under these circumstances than when nestling securely between the furrows, in the midst of the tempting braid. We need not add that, after sowing with the drill, we cannot roll too often nor too much—on most soils in this district, at least. It may be, however, that by all these appliances we fail in attaining our object; then we would suggest as a more certain remedy than any, so far as our present experience goes regarding his appetite and tastes—*vis.*, a change in our cropping rotations, knowing, as we do, that hitherto turnips, potatoes, rape, cabbage, and leguminous crops have escaped his ravages. We are being painfully taught in these days that cereal crops are least of all fitted to meet the many demands on the agriculturist in shape of rent, manures, labour, &c.—indeed, to farm what are more particularly understood as grain-farms must be ruinous, as rents now are. What the British farmer must pay his greatest attention to is his grass and green crops, if so happily situated as an occupier of land that will produce these. Sorely as we are pressed by the foreigner in the article of grain, we have not as yet felt his competition in the production of beef and mutton. Happily, then, do we turn to the expedient of altered rotation, seeing that in adopting one that will rid us of grub ravages, we at the same time are necessitated to produce a crop distasteful to our enemy, yet well suited for the manufacture of our best paying commodities—beef, mutton, and wool. If we can introduce a rotation, then, in which we can have our whole lea break under one or all the crops to which we have referred, we will have stolen such a march as tends to certain victory. We might have the whole potatoes; but in many localities, from want of labourers, they could not be lifted at the proper season, if all were to adopt the practice. We could, however, have one-half, or say one-third, of the break potatoes. They are a valuable crop to be consumed on the farm. Let one-third more be laid down in tares, the cereal amongst them a very small proportion, in case the grub consume it. Experience, we believe, shows the vetches themselves have no attraction for them. Let these be sown between February and June in rotation; then we shall have, by the season our swedes fail us, a capital green feed for our horses and cattle, to be consumed at the farm steading—a system of feeding, we are very certain, far too much neglected in this locality. Our tares, as they come in rotation, will carry us on to the turnips in September, or further if desired. We remember the time when the cry would have been raised against this proposal—“Where can we find fodder to accomplish it?” High farming, however, will have dispelled all fears on that score, the difficulty now being more, How shall we convert our fodder into manure? The answer is, Follow our proposed rotation. The other third is now to be disposed of, and we suggest for it—rape for sheep, and cow-cabbage for cattle, the latter available for either early or late feeding. We confess we are ignorant as to the worth of a rape crop, but we are assured it must be a valuable one for feeding, else it would not be so much grown, especially in England. Let the remaining third of our break, then, be half rape, half cabbage, or it may be made all beans, according to the soil, tastes, and requirements of our several circumstances. The intelligent farmer will never tie himself down to an iron rule, but act with precision as peculiarities arise. Thus we have got the whole occupied, and well occupied too. We hope the days are not gone altogether when potatoes will be more in demand for human food, should they not be required to the extent we have known them. The value of them as a feeding crop for cattle and sheep is high, and added to the tares, cabbages, and rape, they point to an era in agriculture when our manure merchants may occupy the despondent place of the farmer at the present time; for the artificial will be superseded by abundance of the more enduring and valuable production of the natural laboratory of the farm. We say nothing in regard to the preparation of the lea break for these crops. One and all of us may have our own favourite mode, the end being the reduction of the soil to a tilth sufficient for the growth of these plants. As regards potatoes, we all know that if the soil be thoroughly loosened, we need not be over particular about the fine reduction of clods. The cabbage will not require it much finer than the potatoes. The rape and tares will need it somewhat more brought down. Should any one desire to be relieved of the tares, beans, cabbages and rape, then let him make as many potatoes as he feels inclined, and either take a crop of oats, prepared mechanically and manurally, as suggested in

a previous part of our paper—taking a second crop of them—or one of barley, along with the oat crop after the potato break. Will some one say, “This will be opposed by your proprietor?” We answer, Only if he is ignorant that good farming can never prove injurious to his soil. It is yet to be proved that, with high farming, two cereal crops in succession are detrimental to the soil. No mean authorities have been speaking out on this subject last month—Dr. Anderson and Mr. Hope, Fentonbarns. They don't seem to think that in practice two crops of cereal succeeding is exhaustive to the soil; and Messrs. Lawes and Gilbert have been showing that with manurial appliances crops can be taken in succession from the same field for many years. We, however, don't wish to press this question beyond what all our experiences can endorse; and we risk our professional reputation in making the assertion that no good farmer will ever either injure himself, his proprietor, or the soil, by taking two crops of grain in succession. You will observe my words—we mean them to apply where land has lain not less than two years in grass, better if three, and farmed according to the only admissible rule—favourably for the proprietor and himself too. Time was, and still is, amongst not a few, when two crops left the land foul and full of weeds. Now, instead of this, we shall have the land cleanest after the second crop—indeed, given a field very weedy, we should say the best way to get it clean is simply to take a second crop, and make it such as there shall be no room for weeds to grow; and however much some may smile at this, it is practicable on most soils, unless the season be very adverse. We say, then, follow a seven-course rotation if you have not good grass land: 1, grass; 2, grass; 3, whole field potatoes, beans, tares, cabbage, and rape; 4, oats; 5, barley or oats; 6, turnips; 7, barley, with grass seeds sown down. If your land is suitable for grass, take three years' grass and follow as before, this making an eight-course shift. Should a soil be very unsuitable for grass, then we should suggest a fifth rotation, the potatoes to be made out of one-year-old grass, when the other portion would come in two years old for the oat crop, with the potato part, if the whole of the one-year-old lea is not broken up for potatoes, and the other suggested green feeding crops. Of course, in such rotation, never think of taking two white or cereal crops in succession. If one is positively hindered—which, we hope, for the credit of proprietorship, in this county at least, there need be no fear—but if so hindered from taking two cereal crops in succession, then the former shift would resolve itself into a sixth, the other into a seventh shift. In the case of any not caring for the tares, &c., over and above the potatoes, let them allow their grass to lie another year to come in with the potato break for oats. If prevented from taking two crops after each other, in such case make the potatoes out of two years old grass, and oats the following year, along with a crop of them from the rest of grass land three years old. In this way, the potatoes could be shifted every rotation, never grown twice on the same plot without an interval of twelve or sixteen years, according to the rotation adopted. Of all these suggestions, we would prefer the last one as being more ameliorating to the soil, and purpose to adopt it, so long, at least, as oats rule below 22s. and barley 26s., while beef and mutton are so high. The farmer cannot fall into a greater mistake than supposing his principal source of return to be grain. We are convinced that were farmsteads sufficiently ample, and money obtainable by purchase, certainly not at 8 per cent., but at 4 per cent. he need not be over-anxious although he does not sell more grain than pays the labour account. We think, then, that which will commend itself to every intelligent proprietor and factor, as well as make it of easy adoption to the farmer, is the sixth rotation—grass three years, save the part made potatoes, which will be only two; 3rd, potatoes; 4th, cereal crop; 5th, turnips; 6th, crop, sown down with grass seeds. If two white crops are wanted—and, with good farming, no reasonable proprietor, unless ignorant, could object—we would say, three years grass; 4th year, potatoes of a part, while the other part was oats; 5th year, all the break oats or barley; 6th, turnips; 7th, crop, laid down with grass seeds. It will be noticed that there are only two white crops taken from the part broken up for grain at three years old, the other part made potatoes only one crop of oats is taken from it. These hints are thrown out to show the practicability of a change of rotation. In each of our experiences, peculiar circumstances will arise to call forth decision on our part. In regard to such circumstances, those

who require them detailed minutely we are sure are much better to leave themselves in the hands of an intelligent grieve, who certainly, in the case of amateurs, ought to be allowed free action, as an intelligent and good farmer ought ever to enjoy, as he will do, under a good landlord. And this leads us, in conclusion, to say a word on restrictive clauses in leases. We happily know nothing personally about these things as put in force. Perhaps, like more, we may have signed leases containing them; but we feel assured that, so long as farming for our own interest, we are doing so for that of our proprietor, and we would as soon think of a summons to quit as to be restricted in our cropping arrangements. But while most of us may be so happily situated, we certainly would not advise our agricultural friends to adopt a change in their rotations—which would subject them to trouble were an ignorant and ungenerous proprietor to take legal advantage of any restrictive clause in the lease—without obtaining written permission from the proprietor or factor. We have very recently seen a sheriff's decision in the case of one who was said to farm well, nevertheless subjected to heavy damages, because not acting up to the letter of the lease.* Why, there is nothing raises one's indignation equal to such things. A man may be actually meliorating his farm to a large extent yearly, and still be molested very heavily by a proprietor having it in his power to do so. We will not allow ourselves to characterize such procedure. While we say thus much, we would be the last to rob the proprietor of his right. There are bad farmers, and ungenerous ones too, who have no more right to take advantage of a proprietor than the latter has of the former. Because of such, it is absolutely necessary that leases and general clauses in them should be maintained for the good of both landlord and tenant; but let them be made in accordance with the spirit of the times; let there be more elasticity about them, that the intelligent occupier may be encouraged, yet sufficiently strict to preserve the landlord from loss when he unhappily meets with one neither fitted to benefit himself, the soil, nor the owner of it. Amongst ourselves we think there are few proprietors who, having the matter laid fairly before them, would for a moment hesitate to grant the allowed change under their own hand, more especially when contemplating the circumstances in which too many have been placed the last two seasons, involving such loss that, if often repeated, would make the man of competence unable to meet his turn. Mr. Johnston resumed his seat amid loud applause.

The CHAIRMAN then asked whether any member had any remarks to make on the subject.

Mr. ALEXANDER, Bent, said he cordially agreed in all that Mr. Johnston had said, and so exhaustive had been the paper that he believed there was scarcely a remark left to make upon it. He could corroborate what had been said about taking a second white crop from off the same field. He himself had a piece of ground that nothing would hardly grow upon it for weeds. After the first crop he ploughed it with two horses, then with four horses, and his second crop was a capital one; and since then there had not been a single weed upon it (laughter).

The CHAIRMAN believed it to be a general impression that it was not good to take two white crops after one another from a field.

Mr. C. DURIE (the secretary) said such was the general impression before artificial manures were introduced, but now they could force a crop and keep down the weeds. That made all the difference.

The CHAIRMAN: What have you to say on the subject, Bogmuir?

Mr. VALLENTINE, Bogmuir, was hardly prepared to speak upon many of the points introduced by Mr. Johnston. There was a great deal mentioned which really had not come under his experience; but, in regard to the taking of two crops, he might say that he did not approve of the plan, as he had found it to be detrimental to his land. But, as heavy land ought to be treated very differently from light land (and his was mostly of the latter description), it might be different with others. He had, however, found out by experience that it would not do. But he had seen in his day three, and even four white crops taken; but this would be thought rather antiquated now-a-days. Regarding tares, he might say that he did not like the crop. There was

something in the very word "tares" that one did not like (laughter); and he certainly did not like them. Many years ago, he took up his time greatly in growing flax on the system of letting the land, or rather being supplied with the seed, and taking a share with the parties who did so, and in getting the article manufactured; and the speculation paid very well. He had sometimes got as much as £80 per acre by the system. He, at the same time, grew a great deal of tares; but, if he had not stopped growing both, he would soon have spoiled his land. To grow flax was something like destruction for the land; and tares, he thought, were next to it (laughter).

The CHAIRMAN: You speak of tares without a cleaning crop. Mr. Johnston provides a turnip crop between.

Mr. DURIE, Nether-mill, said that tares had answered well on his land, and he had found them profitable in feeding his cattle. He had sown a field with tares after potatoes, and had followed up with a crop of turnips, and he certainly found that his land did not suffer, but the reverse; and he had got a splendid crop of turnips after the tares.

The CHAIRMAN: What did you say was the preceding crop?

Mr. DURIE: Potatoes; and a very good crop. And I had also a very good crop of tares, and not a single weed was left.

The CHAIRMAN: I think Bogmuir may be somewhat prejudiced in regard to tares; but he seems not to have followed up with a cleaning crop.

Mr. VALLENTINE: They were complete ruin to me.

Mr. MITCHELL, Powburn, said that, in 1862, he sowed an acre of tares with two acres of Chester bere, but the grub did not leave a single particle of the barley; and some that he sowed on Pattarrow was eaten up every particle—tares and all (laughter).

Mr. ALEXANDER could not agree with Mr. Vallentine about the tares, in regard to destroying the land.

Mr. VALLENTINE: But how much more manure did you give them (laughter).

A discussion next took place on, whether turnips grew best after two or three-year-old lea; Mr. VALLENTINE, Bogmuir, stating that he had found the turnips after the oldest lea to be the worst diseased.

The CHAIRMAN said he had always considered himself as a pupil of Bogmuir, but he was now inclined to differ from his master, as he had found that some of his old lea-land had produced the best turnips.

Mr. VALLENTINE replied that it was not every old lea that was so well hired as the one Colonel M'Inroy alluded to.

The CHAIRMAN could give several instances in his own case, and knew the price of every acre of them.

The subject of corn-drills, as a preventive, was then introduced, Mr. VALLENTINE stating that, while he used them, he was less infested with the grub than now.

Mr. JOHNSTON thought one of the greatest advantages was the sowing across the furrow, preventing the seed from sinking where the grub was buried.

Several other gentlemen spoke in favour of the drill, and in sowing across the furrow.

The CHAIRMAN thought the presser a very valuable agricultural implement.

Mr. ALEXANDER, Bent, in answer to a question, said he had not yet got his leas harrowed before ploughing, as he proposed to do at last meeting, but he yet thought it would be a capital plan.

Mr. MITCHELL, Powburn, said Mr. Brand, Mains of Four-down, had done so this season before ploughing, and it had scarified them well.

Mr. VALLENTINE: If we could only know when the creature comes to life, we could adopt surer plans to exterminate him.

Mr. ALEXANDER said that Mr. Collie, Haughead, and himself had gone over a lea field the other day, and they found the grub in all stages of life—actual worms of all sizes, eggs, and in every form. In answer to Mr. Johnston, he said they were satisfied it was the grub.

Mr. VALLENTINE: Would you not suppose that the late frosts would have nipped them?

Mr. ALEXANDER thought that it would have killed many

* Mr. Ritchie, Perthshire.

of them. The egg was a mere pulpy matter, and must have been thoroughly frozen.

MR. JOHNSTON: But we have animals which, although frozen, yet live, and I suppose the same will apply to the grub.

The remainder of the remarks bore upon the practicability

of some of the schemes of rotation propounded by Mr. Johnston; and, generally, it was thought that the substitution of green crop for oats after lea, and the taking of two white crops after each other, were feasible on good land, provided the land was well tilled and manured.

A vote of thanks was given to Mr. Johnston.

OILCAKE AND GRAIN FOR CATTLE.

Our worthy friend and constant adviser Mr. Mechi seems to make a point of keeping himself before the public by now and then coming forward with an astounding statement as to profit or advantage that may be gained by the adoption of some particular practice which he recommends with an air of superb self-satisfaction and of superior knowledge and wisdom. Mr. Mechi seems, then, to revel with unbounded delight in the storm of dissent and contradiction which rises on all hands. But when people merely laugh, and give themselves no trouble to call such "great facts" (and he is "particular about his facts," he says) in question, or to contradict them, the main object in view is not gained, and the worthy alderman is no doubt a good deal disappointed. His recommendation to the Cumberland farmers some time ago to give 28lbs. of oilcake a-day per head to feeding beasts seemed to be received merely with a smile, and consequently to fail of drawing upon its author the desired public attention. Some, indeed, charitably regarded the "28lbs." as a clerical error on the part of the reporter or of the printer. At length, however, somebody did notice Mr. Mechi's recommendation, and there was some talk about it at some meeting somewhere. This at once gave Mr. Mechi an opportunity and an excuse for coming forward with a letter, *in forma, de omnibus rebus et qui busdam aliis*, concerning things in general, and the ignorance of farmers in particular.

Now, we will not at present gratify our worthy friend by giving a statement of our reasons for declining to adopt his recommendation, farther than to say that the farmers on this side the "Border" are fully aware of the value of oilcake as a feeding material; but that they know its value for that purpose too well, and the expense at which it is obtained, to allow themselves to purchase it simply as a source from which the elements of manure—nitrogen and phosphoric acid—may be obtained for their fields. They are of opinion that it has been pretty well established that the value of such a vegetable product as oilcake, when turned to its proper purpose—the feeding of animals—is at least equal to twice the value that can be realised from it when used simply as manure. From this tolerably well-known fact, or rather general principle, as to the use of vegetable products that are available as food for man or beast, the extent to which oilcake can be properly and economically used in the feeding of cattle is sufficiently obvious. Not to adduce a more recent authority on this subject, we may perhaps be allowed to refer Mr. Mechi to a source of information to which he is particularly fond of referring others on all occasions, viz., the papers by Mr. Horsfall on "Dairy Management," in the seventeenth and eighteenth volumes of the Royal Agricultural Society's *Journal*.

But not only are we fully aware of the value of oilcake for feeding purposes, but it admits of some doubt whether we do not at times expend money in the purchase of oilcake for cattle feeding when we might with advantage and propriety use, to a considerable extent at least, our own grain instead of it for that purpose. It may be regarded as a sufficiently established fact that more profit is obtained by feeding cattle on a moderate allowance of turnips, conjoined with a certain allowance of more concentrated food, than by feeding on an unlimited allowance of turnips, and that, too, almost under any circumstances, and with either feeding or store cattle. We presume, of course, that straw is allowed *ad libitum* in either case. The results of a few exceptional experiments may, no doubt, be cited to the contrary; but the general results of the great body of experiments on cattle-feeding which have heretofore been made, go to demonstrate that it is more advantageous to feed cattle on say 80 to 100lbs. of turnips per day, along with a certain quantity of concentrated food (from 4 to 10lbs., according to its nature) and straw, than

upon the same straw, and perhaps nearly double the allowance of turnips per day. What this concentrated food should consist of, and how it should be prepared or administered, are questions of the utmost importance to every feeder of stock, and the answers to which depend upon a variety of circumstances and considerations, into the whole of which we cannot now enter. There is one of those circumstances, however, which is liable to vary from time to time, and which ought to be taken largely into consideration as an element in this matter, viz., the current prices which the various feeding materials bear in the market, both relatively to each other, and to the price of beef. Of all the substances now used for cattle-feeding—and which it would be a needless waste of space to enumerate—which are not commonly produced on the farm, and which the feeder has therefore to purchase, oilcake is the safest, the most to be depended upon, and perhaps, upon the whole, the most advantageous when it can be had at a moderate price.

But what we wish specially to draw attention to in the meantime is the price of beef compared with the price of oilcake and of grain, and of these last relatively to each other. Farmers in general seem scarcely to bear sufficiently in mind that, when grain is selling at a low price and fat stock at a high price (as is unquestionably the case at present), it would be more for their advantage to send a portion of their grain to London in the shape of beef, and thereby at the same time increase the value of the manure heap, than to pass it into the hands of the grain merchant, and then pay perhaps double the amount of the money received for it for an equal weight of guano. It could easily be shown on theoretical grounds that the present prices of beef and grain are such as to justify the farmer in using the latter largely in the feeding of cattle. But any precise statement of their relative values obtained by calculations founded on such basis would not be of very great value, because there are numerous practical considerations to be taken into account. Grain can be used for feeding cattle only to a certain and limited extent, along with turnips, or oilcake, or both. But if it is allowed that, in ordinary circumstances, it is advantageous to use a certain portion of oilcake along with turnips for feeding, then it can be shown on grounds which are sufficiently sure and accurate for all practical purposes when—that is, at what relative prices of grain and of oilcake—we ought to turn a portion of our grain to account in feeding, in preference to buying oilcake. And here, moreover, a consideration which is of no small importance has to be reverted to, namely, that in country districts generally, if we sell grain and buy oilcake, we sell in the cheapest market and buy in the dearest; we pay the highest price for what we buy, and receive the lowest price for what we sell. Just now, for instance, English linseed-cakes are quoted at the principal ports at £10; at our nearest railway station we are charged £10 15s. With the grain that we sell the case is reversed.

Having regard, then, to the amount of nutritive matter which analyses, both proximate and ultimate, show to exist in oilcake, in peas or beans, in barley, and in oats; and, having regard at the same time to what actual experience in the use of those substances in the feeding of cattle appears to indicate as their relative nourishing or feeding properties, we are enabled to state their relative "feeding values" with a considerable degree of precision. It is true that in cases of this kind, in which not only complex vegetable compounds are concerned, but in which the action of the animal organism comes into play, so such precise numerical accuracy is attainable as that to which we are accustomed in some departments of science; but the approximates, we repeat, are sufficiently close for all practical purposes—that is, for the guidance of

the farmer in enabling him to select, to use in greater quantity, one substance in preference to another, according as prices vary in the market. The following, then, is the feeding value of oilcake, relatively to beans, peas, barley, and oats, and also of beans and peas relatively to oats and barley:—

- 1 cwt. oilcake is equal to 1½ cwt. of beans or peas.
- 1 cwt. oilcake is equal to 1½ cwt. of oats or barley.
- 1 cwt. beans or peas is equal to 1½ cwt. of oats or barley.

Or, if it is deemed desirable to clear the ratios of fractions, the relation of the feeding value of those substances may be stated as follows:—

- Oilcake to beans or peas, 3 parts equal to 4.
- Oilcake to oats or barley, 4 parts equal to 7.
- Beans or peas to oats or barley, 2 parts equal to 3.

Now, if we take the present current price of oilcake at £10 15s. per ton; that of beans or peas, weighing 63lbs. per bushel, at 30s. per qr.; that of barley, weighing 53lbs. per bushel, at 23s. per qr.; and that of oats, weighing 40lbs. per bushel, at 16s. per qr. (these being about the prices in the country districts, as quoted in our last publication), then the respective prices per cwt. are as follow:—

Oilcake	10s. 9d. per cwt.
Beans or peas.. . .	6 8 "
Barley	6 0½ "
Oats	5 7½ "

But, taking the proportions of feeding values above given, it

appears by easy calculations that at the present price of beans the price of oilcake ought to be only 6s. 10½d. per cwt.; at present price of barley the price of oilcake ought to be only 10s. 7½d. per cwt.; at present price of oats the price of oilcake ought to be only 9s. 9½d. per cwt.; so that at present prices beanmeal is very decidedly the cheapest feeding material. Oats are cheaper than oilcake by upwards of 20s. per ton; while barley and oilcake are nearly on a par. It will be observed that we have placed barley and oats on the same level as to feeding value. There may be some slight superiority on the part of the barley, or, at least, when boiled, it has a more favourable action on the digestive organs of animals; but, taking *weight for weight* (and our present comparisons have nothing to do with measure), its superiority is not very great, and certainly not so great as we had been inclined to imagine previously to making a special examination of the subject. The feeding value of barley would undoubtedly stand higher if we were permitted to develop the saccharine principle, of which it contains so large an amount, before placing it in the stalls; but that we are not permitted to do. That prohibitory enactment against the farmer stands now, we believe, as the only one of its kind on the Statute-book. H.

—*The Scottish Farmer.*

[Our esteemed contributor has forgotten to take into account the superior value of the manure of animals fed upon oilcake. This would to some extent change the relative values of the feeding substances he has enumerated.]

THE CATTLE DISEASE QUESTION.

"The mouth-and-foot disease," like many other popular names of the maladies of our cattle, is, although expressive enough, one of an indefinite kind. Its meaning is evidently rather adjective than substantive—a family rather than a distinct individual case. And besides this peculiar diversity of character, when a large herd is infected at the same time, and every individual in the herd exhibits apparently similar symptoms, there is nevertheless a wide difference in the force or intensity of the malady, some animals being much worse than others; while not unfrequently there are a few exceptions that escape contagion altogether, or at least in whose system the ailment is imperceptible from first to last.

In illustration of the above we give the following example: About twenty-two years ago the writer let his straw-yard and fifty acres of turnips to a neighbouring farmer, who placed one hundred small Highland cattle in the yard. The lot were infected with the mouth-and-foot disease on their way to their winter quarters. There were two or three fatal cases, some three (we speak from memory) out of the hundred having been carried off. A few of those that recovered were to appearance worse than the ones that died. The majority got over it much easier than could have been expected, while one or two hardly ever manifested any perceptible appearance of the malady either at the mouth or extremities. At the same time the general credence was that the whole were infected by the poisonous matter which they had picked up when travelling on the public road.

At the time, the disease was traced to Ireland, and not the continent of Europe. Whether the sister-country had got the malady from the continent is a question which we cannot answer at this date, although one of considerable interest as to its real origin; but the impression upon the mind of the writer is to the contrary, viz. that either Ireland, or somewhere between that and our farm, was the place where disease first manifested itself in an infectious form or type—most probably on board ship in crossing the Channel.

The real source of the disease, therefore, with which the kyloes were infected, must be left an open question, however strong may be the presumption that its true origin was the treatment before the Irish cattle left home, and the hardships they endured during their passage to the United Kingdom, and afterwards in marketing, and in travelling to their various destinations, where it was known they spread far and wide the disease. This is necessary because drovers and cattle dealers who attend different markets, as Edinburgh, Newcastle, Glas-

gow, &c., may have carried the poisonous virus from place to place upon their clothes; for if the saliva from the mouths of the diseased animals left at the watering places and upon the grass, and the matter from their feet left upon the road, were sufficient to infect the hardy kyloes, much more readily would the poisoned saliva left upon the clothes of drovers infect the clean cattle amongst which they shortly afterwards entered, if it was licked off by them, this being the ordinary manner cattle salute drovers, &c.

Whether this was exactly the same species of mouth-and-foot disease as that recently and now being imported from the continent of Europe, is not our present object to inquire. Much less shall we attempt to solve the question as to whether the mouth-and-foot disease which has from time immemorial been prevalent amongst the fat stock in the metropolitan markets is an intermediate species of the family—a species of mouth-and-foot disease which is seldom fatal, and never infectious, so it is said, and which is therefore treated by drovers and butchers' boys after the same fashion as they treat their dogs when they hold out their tongues panting and salivating freely! All that we intend to advance on this head is simply to draw the reader's attention to the fact that they appear to belong to the same family, and therefore point significantly to a common origin; for were the latter confined on board ship for a passage of a hundred miles or so, with all the barbarities attending shipping and unshipping, the comparatively harmless matter from their feet and mouths might under such circumstances assume a poisonous form, and become contagious, and the malady consequently acute and fatal in the highest degree.

Our present proposition is the chemico-physiological one involved in the above three examples, viz. the Irish and Kyloe cattle, the foreign cattle and animals infected by them, and the common mouth-and-foot disease of the metropolitan market. The question, therefore, is chiefly a physiological one.

According to the old saying, "To find out the seat of the disease is to effect half the cure," and, in harmony with the doctrine which the maxim teaches, let us inquire into the effects produced by our present system of fattening and marketing cattle, in order to ascertain if such is sufficient to be the origin or primary cause of the present mouth-and-foot disease. Generally speaking, we have in a previous paper answered the question involved in the affirmation, viz. that the present abnormal dietary of cattle, and barbarous treatment to which they are subject, are sufficient to produce such

maladies. But we have now to show the data or practical details from which such general conclusions are deduced.

In the prosecution of this branch of our subject the reader will bear in mind that the chemical details advanced on a former occasion, explaining why the dietary of our cattle was of an abnormal character, and also their flesh when slaughtered, were as follows, viz.: That obesity, scrofula, consumption, and hereditary diseases of this kind, largely prevail; and also maladies liable to terminate in such; and that the flesh of such animals is unwholesome and unfit for human food, being liable to generate disease in those who consume it. And even in the absence of such hereditary maladies, the flesh of animals, when fattened upon unnatural food, is also unnatural, and unwholesome food for man, being deficient of elements of an antiseptic character, essentially necessary, in the first place, to the health of the cattle, and, in the second place, to the health of those who consume their flesh when slaughtered; while at the same time such abnormal meat contains much crude and imperfectly organised matter, injurious to the health of the animals when alive, and also to people who consume it, animal food forming a large portion of their daily sustenance—a very important consideration in those cases where a large proportion of the daily fare is procured from such a polluted source.

In addition to what was formerly stated on the edible portion of animals, i.e., their flesh, we have now to turn the reader's attention to the circulating fluid—the blood, the coarse fat, and all those parts of the body that are not consumed as human food. These are all also in an abnormal state, the blood being even greatly more vitiated by the absence of antiseptic properties, and the presence of crude, noxious, and even poisonous matter, than the flesh. This is manifest, from the greater liability to undergo chemical change, and to generate substances poisonous in the highest degree if taken into the circulation of the living animal, more especially when the products of decomposition are generated in a confined or partially excluded atmosphere, deadly compounds, analogous to sulphuretted hydrogen gas, being then formed of the most pestilential character. The carcase of an ox or a sheep may be left to rot and stink upon the hillside without much danger; but confine that carcase in an airtight coffin, to undergo chemical change there, and the products of decomposition generated are of a very different quality, and in the highest degree dangerous if allowed to escape by any means; and the products of decomposition in the living body, as *caries*, or mortification of the bones or flesh, are tenfold more dangerous still, as the morbid anatomist not unfrequently feels, to his experience; the smallest scratch by a caried bone proving fatal.

Such is the condition of fat cattle when they leave the stall of the farmer for the distant market, per railway, or steamboat, or road, or all three. The reader who has paid any attention to the chemico-physiology of the subject will readily perceive how absolutely necessary it is to bear closely in mind such facts as those contained in the last paragraph relative to the health of the cattle when they leave home, from a chemical point of view, before they can follow up the inquiry into the subsequent chemical and physiological changes that take place in the animals afterwards, during the hardships of marketing; and it requires very little foreknowledge to perceive that we have in our fat stock all the chemico-physiological conditions necessary to produce almost any abnormal disaster to which brute-flesh is heir to. But let us go into it "piece-meal."

When fat stock are first turned out to market they manifest a certain amount of giddiness and levity, more especially if they have been long housed in comparatively dark stalls, or under a deficiency of light. Such confinement is unnatural, and of itself sufficient to produce an abnormal state both of the solids and fluids of their bodies. It encourages, for example, the deposition of fat, if accompanied with rest and quietness, but an atrophy of lean, with a relaxed state of the muscular tissue generally. Such animals may jump and dance for a short time, but they are soon knocked up upon the road; consequently they suffer greatly when confined in railway trucks and steamers, where they have long to stand upon their feet, owing to the relaxed state of their muscles and the defective process of repair. The nervous system also suffers greatly, some poor brutes actually going mad, the quality of their blood and flesh being both affected.

What we wish to turn the reader's attention specially to,

however, is the relaxed state of the involuntary muscles engaged in the vital processes, as respiration, and the imperfect oxidation of the blood, and eventually of the whole of the fluids, that must of necessity follow. From the time the cattle leave the stalls of the farmer, we must not only bear in mind the chemico-physiological condition in which they were in when they left home, but also watch every process in the animal economy in connection with the circulation, as the mouth-and-foot disease evidently involves a morbid or vitiated state of the fluids.

In following up this inquiry, the first thing that calls for special attention is the heavy waste upon the body, coupled with the absence of aliment and consequent defective state of the reparative processes in these organs and parts of the body actively engaged; and often, in addition to this, is the inhaling of an impure atmosphere, which is always the case in the hold on board steamboats and sailing vessels, and even upon deck, on railway trucks, and in markets, &c.

When animals travel to market by road, any extra refuse matter from their bodies passes off with the urine and insensible perspiration, while at short stages they are fed and allowed to lie down, and thus rest themselves and recruit their exhausted muscles, &c. In this manner, intelligent, active drovers have brought kyloes from the North to the English markets, rather increasing than reducing their weight, and consequently without impairing health. But when put upon a railway-truck or a steamboat, and there confined for a length of time standing upon their feet—a position which requires a continuous exertion of the nerves and muscles—the case is very different, for then all the conditions are present that produce a morbid state of the blood, and indeed of both solids and fluids, as in scurvy and its kindred maladies; and the rapidity and intensity with which morbid action takes place will depend much upon the previous condition of the cattle; so will the disease in many of its peculiar pathological features. Thus if both fluids and solids were in an abnormal state, as previously described, then the moment the alimentary system falls short of a supply of aliment from without, the fat and organism within must be torn to pieces, if we may so speak, to supply fuel to the fire now blazing with increased fury to keep up animal heat and repair the rapidly wasting organs; consequently the venous blood becomes loaded with superfluous matter. As the muscles of the heart and chest become relaxed they cease to perform their functions normally, consequently the quantity of fresh air taken into the lungs is reduced; and when vitiated, as in the hold of a vessel, that of itself has a tendency to check the normal free-play of the chest, from its dialytic action on the motor nerves, so to speak, and consequently to reduce the quantity inhaled at each inspiration. What follows may soon be told, for both venous and arterial blood fast become putrid to excess. The morbid matter naturally falls to the feet, as in scurvy and *elephantiasis*, and, from the already inflamed state of the extremities, generates the poisonous contagious matter which we see given off from them. The mouth, however, and the disease upon the whole, more resembles the form of scurvy under aggravated and malignant circumstances, externally and internally, than the latter—*elephantiasis*. At the same time it evidently shows a wide diversity from either, at least in man. Many of the maladies in cattle, however, do so in appearance.

The conclusion, therefore, to be deduced from the above data is briefly this, that the present system of stock management is capable of producing morbid matter in the system, of sufficient virulence to become contagious by inoculation, and also to produce the blistering effects exhibited in the mouths and feet of animals. Whether it is liable to be preceded and followed by inflammation of any of the respiratory organs or viscera of the thorax is a secondary consideration. We rather suspected that two of the kyloes were carried off by inflammation after they got over the worst stage of the disease, but we had too much in hand to make a dissection of the carcasses. The morbid matter may determine to the lungs, pleura, &c., instead of the tongue and mouth. Great caution is therefore necessary, so as to avoid the hasty and conflicting opinions now being advanced on the subject, without regard to chemistry or physiology.

There are two branches of our subject that remain to be discussed before it can fairly be closed, viz.—1st, The consequences which it entails upon animals that survive, either for breeding or for the shambles, the difference between animals

in which the disease has been generated and those infected by inoculation or otherwise, when the contagious matter assumes a gaseous form, and enters the circulation by the respiratory organs, and is thus with the arterial blood distributed throughout the various ramifications of the system directly; and 2nd, the remedy for the disease. Practically applied, we have in the former three questions, which may be put for solution as follows, viz.—1. What was the difference between the hundred head of small kyloes or Highland cattle that were infected, and the Irish beasts from the sister country, beyond which we were unable to trace the disease, and therefore in which it was in all likelihood generated, according to the presumptive evidence advanced in a former article (No. III.)? 2. What effect has the disease upon breeding stock? 3. And how did it affect the quality of the flesh of the kyloes when they were slaughtered afterwards? The other half of our subject viz., the remedy, we must defer to another time, confining our observations in this paper to the above questions.

In the first of these questions the position of the Irish cattle would be worse than that of the kyloes. Much in both cases would depend upon the previous condition and health of the cattle. Since 1840 considerable improvements have been made in the sea conveyance of cattle from the sister-country, but far greater advances are necessary before a morbid state of the system under the most aggravating circumstances that can well be imagined can be obviated. Generally speaking, therefore, the circumstances of the above period (viz. 1840) will apply to the present time. Much, therefore, at both periods, or, rather, generally speaking, at every shipment at any period, will depend upon the weather. If the cattle are healthy, if the sea is smooth, the atmosphere clear, if the hatches are open, and if comparatively little sea-sickness is experienced, without excitement or general nervous agitation, the animals may land in the United Kingdom from any port in Ireland not much worse for their voyage across the Channel; but if the weather is stormy, the hatches are shut, the cattle not very fit for seafaring life, and consequently much frightened and agitated, and half-suffocated into the bargain, the very reverse would be the result; for between the two cases the difference is sufficient to produce the mouth-and-foot disease, or a morbid degree of the system equally malignant. Now it unfortunately so happened at the time that we could not rely upon the information obtained as to what hardships the Irish cattle actually experienced on board ship. It would require farmers and veterinary professors well versed with stock and stock management to be on board steamboats and sailing vessels at the time to speak to the facts of the case in question; and before they could satisfactorily do so, stormy weather, and the worst that befalls fat cattle, must be experienced before the truth could be fully told. In short, every vessel conveying cattle ought to have an experienced veterinarian on board, as we shall show under next article, the remedy (V.), in order to determine this question, and attend to the health of the cattle at both ends, and during the voyage. But although we cannot speak practically to the point, as to what the Irish cattle suffered on board ship, it is otherwise with the Highland cattle, and there cannot be a doubt that a wide difference existed between the two lots, even granting, for the sake of argument, that the Irish cattle were infected on their landing in this country; for, even under such circumstances, their bodies were in a morbid and prostrate state, whereas the kyloes had only sustained a walk of a hundred miles or so across the mountains from the western to the southern side of the island, which would just make their feet somewhat inflamed and hot, and their mouths dry, and thus qualify both as it were for inoculation with the contagious matter from the infected drove.

All this will appear tangible enough to those of our readers who have attended cattle markets in England, Scotland, and Ireland, for the purpose of buying breeding and fattening stock, and who have been on board steam-boats and sailing-vessels in stormy weather with their purchases. For a similar reason they will also perceive that the cattle trade from Ireland and Scotland by sea is different from the immense and increasing commerce with the continent of Europe, which has sprung up since steam-boating commenced; also, on comparing the two systems—the home with the foreign—it must appear manifest that it fares considerably worse with stock under the latter than under the former; consequently, that the morbid state of their bodies, and diseases produced thereby,

must be of a more malignant and contagious character. Hence the conclusion formerly arrived at, that the Irish case of the kyloes was of a less virulent character than are some of the continental examples now prevalent; that the former is worse than the common mouth disease of the London and other markets; but all three, nevertheless, are of a kindred abnormal character. In short, that there exists a long list of diseases arising from improper food and management, with whose individuality we are not yet sufficiently cognisant to be able satisfactorily to distinguish one from another by the peculiar diagnosis which each presents.

How does the mouth-and-foot disease affect breeding-stock? is the next question that calls for solution. Does it leave an impaired constitution? or any virus in the system analogous to the morbid matter of scrofula or cow-pox, so as to entail upon the bull and cow, and also their offspring, a malady of an hereditary type, that is ever liable to break out afresh under certain exciting causes? We quote the above two complaints, scrofula and cow-pox, for several reasons—first, because they belong, according to "Cullen's Nosology," to two classes of disease, with the several orders of which not half enough is yet known about them, in connection with cattle. According to Dr. Good, and other nosologists, they are associated with other maladies of the skin, mucous membrane, &c. In the second place, our object in quoting them is to draw the reader's attention to the fact that both diseases are peculiar to the live stock of the farm—scrofula to pigs, and cow-pox to cows; that both are contagious by inoculation, are hereditary, and, therefore, transmitted to posterity. Thirdly, that they are liable, under improper food and aggravating treatment of the body, to terminate in contagious diseases of a more malignant and dangerous character; and, fourthly, that under sanitary means as to food and treatment of the body, both maladies are easily kept down to a minimum type, such as hardly to be perceptible. Indeed, some are of opinion that by proper medicinal means, both may be so thoroughly eradicated from the system, as not to be transmissible to posterity.

It will thus be seen, without further illustration, that all our cattle (including the horse, ox, sheep, and pig) are subject to hereditary maladies, from which, perhaps, few individuals are wholly exempt; that the virus of such diseases lurks in the system, ready to break out into an active form under improper food and treatment, and to become, under aggravating circumstances, malignant and contagious in the highest degree.

Again, it may be taken for granted that the virus of scrofula is chemically different from the virus of cow-pox; but what that difference is, in a chemical sense, is beyond our present knowledge in this branch of analytical science. There is also, no doubt, a difference between the poisonous matter of small-pox and cow-pox. It is likewise more than probable that the contagious effluvia of small-pox, when floating in the atmosphere, is chemically different from the semi-fluid matter contained in the pustules of the body of the person or animal that is labouring under this disease. But be this latter hypothesis as it may, it will be granted that the virus of the different kinds of mouth-and-foot disease is each individually different from the others, chemically speaking, either as to quantity or quality, and also from the contagious matter of cow-pox, small-pox, and scrofula. It will further be admitted that if the mouth-and-foot disease is capable of terminating in a malady of a hereditary kind, then this division of our subject is a very important and even serious one, if we may so speak, more especially if it is one that is easily excited into an active and malignant type by the treatment to which fat stock are subject under the present system of stock management in marketing. Such being the cardinal question at issue, we shall purposely leave it an open one for more matured investigation; but at the same time observing that, if the contrary of the above hypotheses turns out to be true, viz., that the mouth-and-foot disease does not leave an hereditary taint upon the constitution, the case must be considered an exception to the general rule.

Several objections will, no doubt, be advanced against the soundness of this latter exceptional conclusion. It has, since the previous article was written, for example, been said, by a high authority (no less than one of Her Majesty's veterinarians) that the malady is only a species of inflammation or pneumonia; but both these are very indefinite expressions, under which "any quack may safely hide his ignorance," as a

very high medical authority once told us, somewhat snappishly, when we applied the term inflammation to one of his patients. That inflammation attends the disease is manifest, in the feet as well as in the mouth and viscera of the thorax; but it is equally manifest that something more than inflammatory action was the matter with the poor kyles and other diseased animals that have come through our hands, when farming; and besides, the practical conclusion thus deduced from results to which we have been eye-witnesses, we have some difficulty, when we turn and examine facts in the opposite direction, to trace the cause from the effect, for we have often been obliged to put cattle upon an abstemious diet, to avoid inflammation; but in the objection the very reverse doctrine is taught, viz., that to put cattle upon a short allowance is to produce inflammation. If you put cattle under close hatches, keep them there without food, the perspiration running from their coats so profusely that you may wash your hands in it, and the atmosphere so close and impure that, like a fish, you are obliged every now and then to come to the deck for fresh air, to prevent suffocation, then such will produce pneumonia in your cattle. Such is the fallacious doctrine which this untenable objection teaches, and we must confess that we do not understand it. We wish to give it the mildest refutation possible, and therefore we shall only add it does not apply to our experience. If cattle that have been kept in warm stalls, and well fed, are exposed upon the deck, without food, we can understand how the lungs might be affected under such conditions, and also if similarly exposed on railways. But then comes another practical question, that if such is capable of producing the mouth-and-foot disease, it would be poor consolation to Scotch and Irish farmers who send their fat stock to the English markets about Christmas-time, for under such a dogmatical rule the cattle would all be diseased during the winter months. But no such result is or has been experienced; hence the conclusion as to the untenable character of the objection, and the necessity that exists for causes that produce mouth-and-foot disease, other than inflammation alone.

The next question involves the quality of the beef and mutton of animals that have had at one time the mouth-and-foot disease, or whose parents have had it; and if quality is affected, so also is quantity. The question, therefore, is a very comprehensive one when examined in all its details, but we shall briefly dispose of it in a few desultory sentences; for if the general health is impaired, it follows, as a matter of course, that quantity and quality are also both reduced. If, on the other hand, it is argued that the general health and fattening properties of stock are not reduced below the normal standard during the time they remain in the stall of the farmer, but that the virus which remains in the body of the animals is liable, under the barbarous treatment to which they are subjected in being conveyed to market, and before they are slaughtered, to be chemically changed into a more active and malignant character, then the dietetic value of the beef and mutton may become so reduced as to render it only fit for "dogs' and cats' meat." Now both of these are very serious questions to the farmer, no less than to the general public or consumer, however much may be conceded to the contrary in favour of those who take an opposite view of the subject, and who cannot see anything wrong with the present system; for in both cases a certain amount of truth must of necessity exist, in magnitude sufficient to deteriorate the quality of the beef and mutton to the consumer, and the quantity to the farmer. And, moreover, by making the unreasonable concession that the mouth-and-foot disease improves the health of the cattle and the quantity and quality of the meat they yield when slaughtered upon the premises of the farmer, what follows? Even granting all this, it nevertheless remains an established fact that the present method of conveying and marketing live stock greatly deteriorates the quality of the meat, rendering it in many cases, where cattle are immediately slaughtered on their leaving the market, unfit for human food, and also in all those cases where animals do not wholly recover from the hardships and harm experienced during marketing. And who bears this loss ultimately? The greater part of it is obviously borne by the farmer. W. B.

FARM BUILDINGS.

THE PAUPER SYSTEM, AND ITS "ROOKERIES."

Our heading this month requires something in the form of an apologetic introduction. There are sins of omission as well as sins of commission, and both require to be watchfully avoided. If there is a Scylla on one side of the channel of life, there is sure to be a Charybdis on the other that requires to be equally guarded against, otherwise the tempest-tossed bark may never reach the wished-for haven to which it is bound. Is the practical problem of breeding agricultural labourers similarly situated? Are there duties to be performed, as well as antiquated and shortsighted objectionable practices that must be avoided before success can be attained? Is the existing system of having agricultural labourers, both single men and married, a Scylla on the one side of the gulf stream, and the total absence of a proper system of cottage economy, coupled with the heavy yoke the toilworn labourers have to bear, together with their own improvident habits, the Charybdis on the other? Or otherwise expressed, as the present system of housing and employing agricultural labourers has bred, and continues to produce paupers in an increasing ratio, is such the sin of commission of which British landowners and their tenants have to plead guilty—the Scylla on which the agricultural back has struck, and become leaky? If so, then they are also guilty of the opposite—the sin of omission—the not breeding of a healthy, industrial, provident, and well-to-do race of labourers sufficient to cultivate the land; the not giving of such labourers regular employment, with suitable household accommodation, and the not educating them how to provide for themselves. On the other hand, by way of some consolation, is it our county and market towns, villages, and hamlets that are guilty of the hevel system of cottages, and of breeding the paupers under an antiquated species of statutory mode of settlement and management, over which the agricultural

landowners and their tenants have no effective and responsible control? To this the facts of the case may safely be left to return their own tangible and convincing reply. But, even when done, we are more than apprehensive that the agricultural party have allowed their noble ship to strike the fatal rock and break her timbers in more places than one; while they are also guilty of the sin of omission, as before, of not breeding a sufficient supply of the opposite class of labourers, and of giving them regular employment all the year round, and suitable cottages rent free; for, when we examine closely the small freehold system of voting, the laying down of large areas of the county into permanent grass, and the clearing of all such grass lands, together with, in too many cases, arable farms also, of resident labourers, it appears manifestly subject to a practical demonstration that they have been something more than mere tacit lookers-on to the establishment of the present pauper-breeding system, and the humbling manner it is now sapping the moral, social, and physical wellbeing of our agricultural labourers. Are they fast sinking in the equally fatal whirlpool?

The subject is thus manifestly no less comprehensive than complicated and difficult to be seen in all its bearings. We can breed crack hunters and race-horses, the best in the world, and house them comfortably too; also first-rate working teams for cart and plough; but when we come to the heavy drudging stock of the genus *homo*, we are yet, it appears, greshing to our profession. We rear them in abundance it is true, but there is a large proportion of their numbers that cannot perform the function for which they are thus professionally brought up. When the plain truth is fully told in detail, there is some physical defect about them, and not infrequently also something that is morally and mentally at fault. But confining our observations at present to the former, the purely physical question, there are large numbers of our workpeople who are really unable to

eat their bread in the sweat of their own faces, according to the Divine rule, while there are others who are not regularly employed: consequently they eat their bread in the sweat of other people's faces. In other words, they are paupers, wholly or partially supported by the industry of others. It follows that our industrial practice is manifestly defective in its working details. It is not *sound practice with science*, but a spurious industrial malformation, constructed and upheld on erroneous principles, and whose mechanism therefore requires to be taken literally to pieces, thoroughly examined, repaired where necessary, and then reconstructed after a new design, and upon a totally different foundation, in accordance with the above golden rule, very judiciously adopted by the Royal Agricultural Society as its motto, although not as yet successfully followed professionally in the case under consideration.

Of the magnitude of the industrial fabric, and of its national value, little requires to be said, as agricultural labourers are without a parallel in either case, there being no other class equal to them in number, or the produce of whose labour amounts to an equal annual value. The vexing complications of the pauper question also vanish into thin air the moment the industrial machine is taken to pieces, as above, and the several parts practically examined in the light of applied science. Thus the occupation is pre-eminently healthy. In this respect the agricultural labourer, if properly fed, clothed, housed, and harnessed, enjoys innumerable advantages over any or all of the other labouring classes—advantages equally in favour of mental and physical development. The occupation, therefore, is in favour of breeding healthy, robust men and women, hale, able, and willing to support themselves to the very last, without having ever to be entered upon the list of paupers. This conclusion we have often seen written in practice, as shown in a previous paper.

Again, the ground requires to be annually cultivated, and would amply repay a great deal more labour than is generally bestowed upon it. The demand for labour, therefore, if the operations of the farm are properly conducted, ought to be uniform, affording regular employment all the year round to labourers. Opinionative exceptions may no doubt be taken to this, by those who cannot see the beam that is in their own eyes; but objections of this kind we shall toss to the winds afterwards.

We next come to food and clothing; and in both these respects the agricultural labourer who has a cottage and garden, and who works during the day with little more on than the shirt and trousers, and whose dress requires to be of the plainest description, occupies, or ought to occupy, a very favourable position as a labouring man—one equal, if not superior, to most of the other working classes. In point of fact, all things considered, from a dietetic and alimentary point of view, the position of agricultural labourers ought to be far superior to that of any other working class, because, on the pure air, water, and healthy exercise, he gets the full benefit of his food, and so does his family. For a similar reason—the enjoyment of pure air, health-giving exercise, and the normal performance of the process of calorification, or of keeping up animal heat, or the natural temperature of the body—he actually requires, when thus properly fed, fewer clothes in the winter season than many of the other labouring classes less exposed to the weather. Food and clothing, therefore, under proper management, ought to be in favour of agricultural labourers as a class, and diametrically against pauperism.

Cottage economy ought also to be in favour of agricultural labourers as a class, and against the existence of pauperism. Thus, when their cottages are situated adjacent to the homestead, as formerly noticed, they are in favour of the highest degree of social and physical well-being. This is subject to very ready proof; for, as land is always dearer about towns and villages than at the homestead, it follows that a cottage and garden could be more economically given at the latter than at the former. The purity of the atmosphere is still more in favour of the position at the homestead; so is the economy of time and labour. In point of fact, it would be superfluous to draw any comparisons between a proper cottage at the homestead and one situated anywhere else. The solution of the problem, therefore, hinges upon the practicability of building a cottage capable of furnishing suitable household accommodation to an agricultural labourer and his

family. Is it practicable or impracticable? Looking at the produce of the man's labour, the latter interrogatory must evidently be considered to involve an absurdity. A positive answer must therefore be given to the former. Cottages may be built, in which to rear healthy, industrious labourers, and thus, under proper management, avert pauperism.

Proper tools in the hands of labourers (our last head) are so essentially necessary to the successful performance of work, and to the physical health of the workmen, that the force of the proposition may be taken for granted. With improper implements, labourers at the close of the day find themselves over-fatigued, while their employers often do not receive half the quantity of work done, as compared with other labourers efficiently harnessed. It therefore follows that old-school farmers, who fiddle-faddle with antiquated tools and implements, are the real nurses of pauperism, as it soon wears their own coats threadbare, and brings their ill-paid, ill-fed, overtasked labourers to the Union; that, on the contrary, agricultural labour should be abridged as much as possible by improved machinery; and that the labourers should derive the legitimate advantage due to them for the proper and effective working of such improved implements and machinery. Steam ploughmen, for example, who work steam ploughs successfully, should receive longer wages than those who continue to work the old and less productive class of ploughs. In other words, if the farmer derives a greater benefit from steam culture, the faithful and industrious labourer has a just claim to a fair share of the extra advantages thus gained, in return for his extra skill and improved labour in the management of the steam plough.

The counter-practice to the existing one of housing and rearing paupers in our hamlets and villages must therefore be taken as within the reach and open to the adoption of every landowner in the kingdom. It consequently follows that, with proper means and management, pauperism may be reduced to a minimum.

Nothing, therefore, can be said, abstractedly speaking, in favour of the present system of cottage economy—so abundantly prolific in pauperism. The sweeping condemnation that is now everywhere pronounced against it cannot be extenuated in the slightest degree. No doubt when the tithe-proctor was abroad in the harvest-field amongst the sheaves, and when the poor-laws were less perfect than they at present are, there was good reason for grumbling on the opposite side; but it is very questionable even if the working of the tithes and poor-laws referred to justified the depopulation of whole districts, by throwing arable lands into grass, and the crowding of the labourers into towns and villages to shift as they best could for themselves, and thus lay the foundation of our present pauper-breeding system in hovels and dormitories highly discreditable to the country. Taking the most lenient view of the case, it certainly has proved itself to be from the first but a shortsighted policy—eventually as much against the best interests of landowners and tenants as adverse to that of the labourers themselves. Thus, whatever might have been said in its favour by individuals at the outset, those individuals at the present day will best hide their shame by keeping out of sight, for there is not a cottager in the kingdom who could not justly sing with the classic poet of old.

“*Hic patriam auro-vendidit.*”

And such too is the only general conclusion that can be drawn from the premises; for, purposely cheating the parson and the poor-house in the district from whence the labourers were ejected, they increased the labours of the clergy and the amount of poor-rates in those towns and villages where the poor people found shelter and employment. Again, the reduction of the area of arable land would reduce the demand for labour, and hence the wages in the districts which received the extra supply of labour (*i. e.* labourers). The gain thus realised, or reduction of wages in the outset, might cover the extra poor-rates; but all the while the physiological effect produced upon the labouring population is manifestly a lower degree of mental and physical energy—the slow breaking up of the industrial constitution, accompanied with a gradual increase of pauperism: How could it possibly be otherwise?

In examining the facts of the case during the period in question, it must be borne in mind that Social Science has made rapid progress in all the other branches of labour, the domestic and general circumstances of the labouring population having been upon the whole greatly improved. As this

has been effected principally by machinery, steam-power, and a more economical subdivision of labour, the details no doubt present many exceptions to the general rule. Thus, old-fashioned people have clung to their old habits in hopeless rivalry against the progress of things, and, of course, have justly suffered. But this is something analogous to the conduct of those landowners who, by throwing their arable lands into grass, returned to the old antiquated pastoral system of their forefathers, as it evidently forms part of the pauperising system which we condemn. Again, although agriculture did not keep pace with the general march of improvement at the outset, farmers have of late made very rapid strides in the use of steam and machinery, so that at the present time there are many who do not any longer linger behind in the rear. In point of fact, not a few of them are a-head. There is no doubt a large number who do not occupy so favourable a position. Now, has the social condition of the agricultural labourer kept pace with these advances as it ought to have done? The answer to this does not hinge upon the amount of wages daily, or even weekly, received by him, but upon his yearly income taken into consideration with his expenditure, and the social, moral, and physical well-being of himself and his family. If a man gets 15s. per week for working improved machinery, in seed-time and harvest, which enables him to do double the work he could have done with the old implements, but is also half his time lounging about the village idle, it is tantamount to 7s. 6d. a-week, and even less than this, practically considered. In short, what between the influx of Irish labour in harvest and the existence of non-resident labour at home, the general effect produced by improved implements, steam, and machinery has been to disorganize the uniform demand and supply of manual labour, than which nothing could be more against the interest of farmers, or effectively calculated to enervate and pauperize labourers. We repeat there is nothing so enervating, demoralizing, and pauperizing as irregular employment; for when idle labourers are compelled to lounge about the village for the want of employment, the bad lead the good astray, so that the humbling consequences may more easily be conceived than told. And what renders the village system and non-resident labourers ten-fold more objectionable is the fact that improved implements, steam, and machinery in the hands of resident cottagers on the farm ought to produce the very opposite effect upon their social and domestic condition, and at the same time greatly enhance the value of steam and machinery to farmers. But to the influence of steam and machinery on agricultural labourers we must return under a different heading.

IMPROVED COTTAGES, MACHINERY, & LABOUR

To make farm buildings pay, proper implements, machinery, and live stock must be employed; to make the most of steam engines and other machinery, they require to be kept continuously at work; and when this is done a greater number of labourers find regular employment upon the farm all the year round.

Such is the proposition we propose discussing in this paper. It is one that is doubly interesting at the present time, owing to the numerous practical questions involved. Thus on the one hand we have steam culture and cottage economy together, with the several individual pecuniary claims of the landlord, tenant, and labourer; and on the other hand there are the several interests of implement makers and builders, with their kindred manufacturers and artisans. In the oft-quoted semi-pastoral times of our forefathers, the good old patriarchal rule which then existed was one of simple division; but it is otherwise now, in consequence of the greatly-extended subdivision of labour, through the instrumentality of steam and machinery, or rather through the progress which chemistry and mechanics have made and are now rapidly making in connexion with agriculture, and without which the former party—the landlord, tenant, and labourer—can no longer maintain their position in society. The farmer who thinks to get on in the work without keeping pace with the chemical and mechanical appliances of the day is only at the best, but "a day dreamer;" for he can neither pay interest on the capital invested in the erection of the homestead or the cottage, nor make suitable provision for himself and his family: in

short, "*nothing pays him.*" It follows, therefore, that through his shortsighted policy, the just claims of all the other parties interested are less or more sacrificed.

Our subject consists of three distinct parts, each of which may be enumerated in the form of a separate proposition. Thus—*First*: The proper chemical and mechanical appliances necessary to be adopted, so as to make the most of the land and its produce. *Second*: The most economical use of such chemical and mechanical means. *Third*: The reduction of the first and second propositions to practice will give regular employment to the greatest number of labourers all the year round upon the farm. In other words, it will require the greatest number of cottages, and give regular employment to the greatest number of cottagers.

Chemical appliances include artificial and farm-yard manures for the land, and feeding materials for cattle: more generally expressed, animal and vegetable food, or food for our crops, our cattle, and ourselves.

Mechanical appliances, again, embrace not only the implements and machinery, but farm buildings of every description, with all their appurtenances, as also roads, fences, drains, &c. Now as each has its own peculiar function or purpose to serve, it follows that its mechanism should be of the best description, otherwise a less profitable result will be produced. Thus the cottage and garden of the labourer have both chemical and mechanical purposes to serve. If, for example, the garden fence is an antiquated make-shift, affording little or no shelter and protection, the quantity of produce may not be half what it would be with a proper fence, the management in both cases being equal. The cottage again may be suitable as to situation and dimensions; but if its mechanical appurtenances, as the doors, windows, fire stoves, chimneys, &c., are defective or bad, such will greatly reduce its value to the cottager. On the other hand, if the above appurtenances are good, but the dimensions of the cottage itself too small, and the distance from the homestead too great, then its function will be abnormally performed, and consequently its value to the landlord, the tenant, the labourer, and the public, will be deteriorated accordingly, in comparison with a properly constructed and situated cottage. In both these cases it must be borne in mind that the whole loss of the bad cottage does not fall upon the cottager, any more than the whole gain from a good one, as formerly shown; for with the bad cottage there is not only a deterioration of health, but a waste of food, fire, and clothing, so that the labourer is unable to perform his daily task, save at a sacrifice of his general health. During the prime of life his employer may screw out of him a full allowance of work, or he may give it willingly; but the end will be the Union and a less healthy family of labourers to succeed him. Hence the general loss. And even when the cottage and garden are both right, and either the wages of the cottager or his professional and moral character deficient, the result will not be favourable; for, as formerly shown, if the cottager's wages will not supply a sufficiency of food, his health and strength must be injured; and, with regard to his professional and moral character, if his habits are improvident, his garden is full of weeds, and his house and clothes are not kept clean, it will signify little how perfect they are as to their mechanical construction. The use of the cottage and garden, however, falls under the *second* proposition; but the above will show how intimately the several members are connected together so as to form one mechanical system in farm practice.

The economical use of such chemical and mechanical systems (our *second* proposition) will be best illustrated, the latter by some of the implements and machinery employed in the cultivation of the land, and the manufacture or preparation of its produce for market; and the former, by the crops and cattle grown. In either case it will require little demonstration to show that however superior in point of quality both may be, their proper application is essentially necessary, in order to make the most of the land and its produce, animal and vegetable. Thus, however good the engine tackle and steam plough may be, unless placed in the hands of efficient workmen it won't pay. And unless the land is properly cultivated, manure cannot be successfully applied. Results are similar in the case of sowing machines, reaping machines, and thrashing ma-

chines; and, in short, every implement and machine upon the farm. It is only when they are placed in the hands of skilful, intelligent, and industrious workmen that they pay. And why? Simply because such hands make good work, and more of it, and also take care of their master's property. In point of fact, were we to state the actual difference between the results produced by good and bad workmen, it may be safely presumed that more than the half of our readers would not give us credit for the facts of the case, however manifest. In the case of live stock, again, how much depends upon the talents of the farmer, his cattlemen, and shepherds! Again, however good the mechanical system as a whole may be, and however talented may be the workmen into whose hands it is placed, the two only pay when they are both kept regularly employed "all the year round." Thus, if the hands are idle for certain periods of time, or for intervals of time, then either the mechanical system, or its adjunct the chemical system, is defective; or it may be both. If any part of the body grows faster than another, it is pronounced deformed; and just so it is with the mechanical system in question; for, if, by means of steam ploughs, drilling and sowing machines reaping machines, and thrashing machines, the whole of the arable lands are ploughed in one day, sowed on the next, harvested on the third, and thrashed and sent to market on the fourth, and the labourers thrown idle for the remainder of the season (supposing such were attained), then the system is imperfect, because it does not give the labourers and the farmer full employment. In such a case, the cottager would be the first to experience the industrial defects of the system; but the ultimate loss would fall more heavily upon his employer and landowner, as they would have either directly or indirectly to support him and his family while he was out of employment, during which time they would have no profit themselves; whereas had he been actively engaged, he would not only have supported himself and family, but also have returned his employers fair remuneration for their division of the labour. The more cheaply and expeditiously the land is ploughed, seeded, hoed, harvested, and its produce prepared for market, the better; but to derive the greatest advantage from mechanical agency, in the economy of time and labour, the agriculturist must discover means for finding useful employment both for himself, his labourers, steam engines, and working stock, all the year round. The landowner and tenant must always bear in mind that they themselves, as well as the cottagers, form each an individual member of the same industrial system, and that if they are idle for intervals of time, the system of which they are members is defective.

It may not be easy for some people to see clearly through the short-sighted policy of not giving their labourers full employment all the year round, especially when they have no experience in anything else, and when they themselves prefer an extra force to-day and idleness to-morrow; and under imperfect laws of settlement, rating, and colonization, such pseudo-economists may gain for a time; but in a free country like this, with boundless colonies inviting our surplus labourers to leave our shores, the accursed system of broken time is one that will eventually not only work its own cure, but visit upon its authors' heads retributive justice. If, for example, 1,000,000 hands are employed on British agriculture, in seed time, hoeing, and harvest, and only 500,000 during the remainder of the year, then there is a natural force in operation to reduce the number of hands required by farmers during the above busy periods to the lesser number of 500,000, to whom they give regular employment. No enlightened and independent country like England will submit permanently to keep up a reserve force of half-a-million of idle hands, supported by poor-rates, to uphold an imperfect agricultural system like this; and even if the country would stoop thus to trample the Divine rule of economy under its feet (viz., every man to

eat his bread in the sweat of his own face), it requires a galloping gauntlet to suppose that, with the progress of education and colonial enterprise, our labourers (themselves will much longer submit to what they now experience; and this, too, premonitorily humbling as it is, does not portray the darkest shade of the future; for were the reckless, immoral, and improvident families to emigrate to our colonies, it would rather be a blessing than a misfortune to the mother-country; as the better class remaining would form the parent stock from which a future supply of labour, under proper management, would eventually be obtained; but when the reverse of this is the practical rule, i. e., when the more intelligent, industrious, enterprising, and well-doing families bid farewell to their native parishes, they leave behind a very different race for the industrial and social exigencies of both the present and future.

Again, indirectly the present system of housing agricultural labourers in hamlets, villages, and towns, and supporting such a large proportion of them by poor-rates, is more expensive to landowners and their tenants, even from an exclusively poor-rate point of view, than were they resident upon their estates and farms. In other words, those landowners and tenants who have cleared their estates and farms of cottages and resident cottagers, to avoid the payment of poor-rates directly, pay a higher poor-rate indirectly in the form of an increase in the price of sugar, tea, and other commodities obtained from the villages, &c., while they at the same time receive a less price for butter, eggs, and other agricultural products, than they would do, had the people of the hamlets, villages, and towns not the extra poor-rates to pay. So manifest must this appear to any one who has studied the effect of taxes of any kind levied upon commercial and manufacturing interests, that it would be superfluous, in a paper of this kind, to enter upon the details of its political economy. It only, therefore, remains for us to point out that the heaviest part of the burden very justly falls, in the end, retributively upon landowners. The villagers may be called upon directly to pay the rate to the collector; but they lay the amount, with interest, on their goods. Their loss is indirectly felt. The ill-fed and housed cottagers, again, cannot perform the same amount of work as if resident on the farm, well fed and housed, and free from rates and rents. The balance-sheet of the tenant, therefore, compels him to pay a less rent to his landlord than he otherwise could give; and to these losses must be added another—the extra amount of private charity which the system involves.

Brief as have been our remarks under this head, they have extended to greater length than is compatible with our limited space, so that we must leave it at present, in order to take a cursory glance at the third—the regular employment of a greater number of hands all the year round than are at present engaged. Those who are in the habit of hiring an extra number of workpeople in hay and corn harvest may think they could not possibly get on otherwise; but farmers who thus hastily conclude their own practice is the rule must bear in mind that the proposition is one that is practically solved in numerous cases. We ourselves, for example, have followed the practice, and were never behind those who pursued the opposite. The continuous-service or regular-employment practice requires more machinery and a greater number of hands than the broken-time one. The former also involves the use of a larger amount of manure than the latter. It likewise yields a larger return of produce for market, both animal and vegetable. It, in short, is more artificially organised, and scientific, and consequently requires more skill and capital on the part of the tenant, with a corresponding amount of whip exercise, so as to keep the chemical and mechanical systems both in active operation, and thus to make a paying profit out of them daily throughout the year. On the other hand, it is less routine in its character, and free from the bad health, rags, idleness, and beggary, so conspicuous in the broken-time system.

ENGINEER.

LOCAL INDUSTRIES AND RESOURCES OF SOUTH AFRICA.

Perhaps no part of the world presents a finer field for combined scientific research than the southern portion of the African continent, and certainly no other region occupied by a European race can boast of so little united effort of this sort. The natural history and physical features of South Africa are but partially and slightly known. With the exception of its botany, which is well represented by the "Flora Capensis," now in course of publication, there is no satisfactory record or description of the general characteristics and capabilities of the whole country, viewed as such. Fragmentary disputations upon particular districts have from time to time been published, but they are avowedly limited and local as to scope, and are by no means exhaustive as regards the subject. Very little indeed is known of the natural relations and affinities that may subsist between these different states or colonies. There are no means of comparing the varying experiences of all, and of ascertaining how far the natural conditions of one affect the others.

No attempt has been made to give a body and form to the geography of South Africa. A few general facts are commonly understood in reference to one or the other of the different divisions of which the country is composed, but they have no connexion with, nor bearing on, the circumstances of the rest. We know, for instance, that the Western Province would grow corn well, were water available; that the Eastern province is better fitted for grazing than for agricultural pursuits; that Natal is a compound of both, with a superadded capacity for tropical culture. Of British Kaffraria, the Transvaal Republic, and Orange River State we know scarcely anything. No one doubts that there is a large mass of useful and reliable facts; but the mass is utterly crude, undigested, and in the present state of its constituents, quite unavailable.

These are the views enunciated by some of the most intelligent colonists, and by the recent Cape mail we observe a movement is on foot, which has been laid before some of the agricultural, literary, and other societies, for the establishment of a South African Association for the promotion of science in its application to local industries and resources. Such a step carried out would be highly beneficial.

We have in the United Kingdom established an organization which commands during its short annual spell of active life as much interest as the Imperial Parliament itself. And, indeed, what is the British Association for the Advancement of Science, but a Parliament, the franchise of which is an intellectual instead of a pecuniary one? The yearly gatherings of this great institution are the milestones of scientific progress. They are the times when all the discoveries and investigations of the previous twelve-months are brought to a practical issue and made subservient to human needs. Men who have been prosecuting inquiries on kindred subjects, in all parts of the

British islands or the continent, are then brought together, and compare notes, exchange experiences, and are able to arrive at definite and reliable conclusions. The beneficial influences of such an interchange of opinions and observations cannot be over-estimated. An impetus is given to every branch of industrial enterprise. Agriculture, manufacture, commerce, all sensibly profit by the proceedings of such an association, while a more thorough understanding is secured of that interesting problem to us all—"the land we live in."

Although in the matter of pure scientific research the field of operations for such an association as that proposed would be positively unbounded, agricultural development would obviously be the moving principle of its more important functions. By comparing notes on the growth of any one class of products in different districts, it would be seen how far, and in what way, the various conditions of soil, climate, and locality, affected the plant. All questions relating to prevalent diseases, in both the vegetable and animal world, would be most advantageously handled by a body which combines so many views and experiences. The vine disease, the lung and horse sickness, and the ailments of sheep are topics which afford ample scope for the united consideration of practical knowledge and scientific inquiry. "Alternately the nations learn and teach," said Cowper, and his aphorism was re-echoed on the walls of the last International Exhibition. Few countries are more arbitrary and capricious than South Africa in varieties of soil, product, and feature, and this is another reason why such an interchange of experience and views would be interesting and profitable.

There are openings for rural industry in the growth of products that have never yet been even thought of. There are opportunities to make money in the simple utilization of indigenous plants and properties that are "wasting their sweetness" in reckless abundance around them. The capacities of the soil are far from being fully tested. Horticultural acclimatization will work wonders in Africa as it has done in Australia and America. Twenty years hence there may be staple articles of export produced with which at this moment the African colonists have, locally, no acquaintance.

It is intended that the society should annually hold a meeting in some town either in Natal or the western and eastern provinces of the Cape Colony in rotation, at which papers contributed might be read on the progress of, and other subjects connected with, South Africa; that the best of these should be selected and published. Means might also be taken that some of the most interesting of these papers should be communicated either to the British Association, the Society of Arts, or some other equally important society in England. At last year's meeting of the British Association, a special committee was formed of some very eminent savans, with the view of inducing societies and private individuals in extra European coun-

tries to communicate on the subject of acclimatization and domestication of different animals, and the effects of interesting, and the diseases peculiar to the animals in those countries.

Among the subjects on which it is thought farmers and others might contribute papers, are: "On the breeds of sheep best suited to the different parts of the colony, and their peculiar points of excellence."—"On the effects of interesting the Cape and Angora goats, and the qualities of the pure and cross breeds."—"On the suitability of foreign animals for introduction into this colony; their nature, the kind of country they inhabit, and their valuable qualities; also the means and expense of introducing them."—"On the means of preventing the extinction of our most valuable wild animals, and their capabilities of being domesticated."—"Whether the eland might not be bred as a valuable animal for food."—"On the yearly progress of different parts of the colony."—"On the alpaca, silkworm, indigo, and tobacco culture.

There are many openings for men of small means in South Africa, although tropical agriculture in its present phase holds out few attractions to the cotter. There is a vague but common belief current that peasant proprietors have but a poor chance along the coasts. This class is by a tacit understanding sent in search of a livelihood to the midlands, where corn-fields, piggeries, and sheep-folds are presumed to offer them their only appropriate avocation. Now may there not be considerable delusion in this? Is it really a positive conclusion that tropical agriculture and peasant enterprise are wholly adverse to each other? Is the sun so stubborn a foe to the English cottager that he only allows the latter to thrive under him on the cold side of 30 deg.? These are questions that past experience fails to answer, inasmuch as it has never been tried. Our countrymen have been sent by the shipload to the kindred shores of Canada and Australia, but they have never been shipped to lands nearer the tropics. Probably this may be due to the fact that in those lands, until very recently, local labour was superabundant. New ideas, however, have possessed the popular imagination, and this most important question is now being tested in South America, Natal, and Queensland. All true Englishmen will hope it may succeed. Unless this class largely prevails in the community, the population in Natal and other places cannot be expected for years hence to attain that numerical preponderance over the black population which all desire to see established. Moreover, no countries are so prosperous, so well ordered and well governed, so superior in social and domestic qualities, as those that have as the basis of their population a large substratum of the yeoman class—the independent, hard-working, petty agriculturists—the men who extract from the soil its lesser fruits.

It is true that English peasants may not be able to grow sugar advantageously in Natal—though the metayer system has not yet proved wholly unsuccessful—but there is no reason why a poor man who has leased or bought thirty or fifty acres, should not have his patch of cotton, coffee, or tobacco, and make a living out of it. All three bid fair to be as profitable there as they are elsewhere. The latter is more particularly deserving of attention, because it requires little ground, is easily cultivated, and calls for no outlay of capital. In Syria, where the finest tobacco in the world is grown, it is all produced by the poorest of the people, who cure it in the huts they sleep in, and flavour it with the dung of the goats that form their only stock. The way in which the best varieties flourish in South Africa, and the extent to which it is now being grown, together with the fact that it is indigenous, encourage a belief that small growers might cultivate it to

great advantage. The same may probably be said of cotton. There is an old proverb that "the poorer the man, the larger the family;" and it is in growing, and especially in picking, cotton; that the parent whose quiver is full may be deemed happy. A man possessed of a large and little family could cultivate and pick ten or fifteen acres of cotton, without recourse to either coolie or Kafir labour, and even at the lowest estimate the yield would be enough for a livelihood, according to the English peasant's frugal and modest ideas. As regards coffee, if a man is lucky enough to have secured a patch favourable for its culture, and if he has managed to make both ends meet during the probationary interval, by the growth of some rapid and marketable cereal, he may expect to obtain much larger returns from a much less extent of ground.

Australia has worked wonders in the way of acclimatization. She has occupied her pastures with sheep and cattle from Europe, camels from Asia, and alpacas from Peru; vitalized her rivers with edible fish from the rich streams of Britain; and filled her stables with horses from the old country, and ponies from Timor. Natal, like the rest of South Africa, is more favoured in its zoological developments, and has less need to draw upon animated nature in foreign regions. But there is vast scope for effort and improvement. Sheep are an entire innovation; and we are glad to find that the character of her flocks is being continually refined by the importation of valuable stock. Mr. Baker has imported six noble French rams, from the estates of the best Imperial flockmasters, and which are therefore of unquestionable superiority. In addition to these, Mr. F. J. Dickenson announces the expected arrival of several of the celebrated Rambouillet sheep, a breed that is high in favour throughout Australia. Some valuable stock-horses and brood-mares of the true "Clydesdale" stamp, famed of Pickford and Barclay, are shortly expected. These will, it is hoped, effect a change for the better in the style of the draught-horses. The fault of the local horses is, perhaps, that they lack bone and sinew enough for draught purposes. They are admirably adapted, as roadsters, to local requirements in that line; but they have not body enough for general draught purposes. We look forward to the day when horses or mules shall largely displace oxen upon the principal thoroughfares; and although the periodical "sickness" is a drawback and impediment, yet we do not despair. The beasts that are being sent out possess great power and size. Some cattle are also expected under the same auspices.

Alpacas will yet, we hope, do for Natal what they are doing for Australia. They are animals that thrive anywhere, and best of all in a hilly country. The massive "undulations" of that colony ought, therefore, to suit them to a nicety. The expenses of introduction are notoriously excessive, owing to the difficulties and losses attending their removal from the mountains of Peru to the shore. They are not, moreover, as is popularly imagined, mere goats or sheep. They are as large as small horses, with long legs and long necks, and a profusion of long coloured hair. Their taste for food is very accommodating and varied. By no means addicted to one sort of pasture, they will either graze or browse, chew grass or nibble at shrubs and trees, as occasion compels them. From all accounts, they would stand a fair chance of thriving either on the coast or up the country; but in rugged districts like the Juanda the alpaca would probably be in its element. So important do we deem an attempt to introduce and acclimatize this animal in Africa, that we are glad to learn a sufficient sum will probably be voted by the Colonial Government next year for the express purpose.

THE COLONY OF QUEENSLAND.

Among the Australian settlements which have lately attracted most attention among intending emigrants is the young colony of Queensland, a territory which has sprung into notice and unexampled prosperity with amazing rapidity. Although the youngest British colony, it is the most extensive of all in point of territory, and already in the fourth year of its separate existence, ranks ninth in point of revenue and importance among the forty-eight dependencies of the Crown. For there are now only eight colonies entitled to take precedence of Queensland in this respect, viz., Victoria, New South Wales, Canada, South Australia, New Zealand, Ceylon, Mauritius, and the Cape of Good Hope, while it is easy to foresee that in a very few years Queensland will have outstripped several of those communities as yet before her.

From a careful calculation of the present area of the colony made by the Surveyor General, it appears to be in round numbers 678,600 square miles, and the approximate area of the country occupied by pastoral stations is 195,000 square miles. The seaboard extends 2,250 miles. It will be seen by these figures that Queensland is by far the most extensive of the British colonies. It possesses an area nearly double that of Canada; and if compared with European States, is one-half larger than England, Ireland, Scotland, Wales, France, and Spain, all added together. It is, in fact, nearly equal in area to one-fifth of the area of the whole of Europe and its dependencies. Pastoral occupation has already spread over a surface twice as large as that of the British Isles; and it is annually advancing onward at a rate which will soon place its stockholders on the shores of the Gulf of Carpentaria.

Agriculture does not yet occupy a prominent position in the industry of Queensland; that it will hereafter do so no person acquainted with its many varieties of climate and soil can necessarily entertain any doubt. It has been satisfactorily shown that the vegetable productions of both the temperate and torrid zones thrive in different districts of the colony. Potatoes and maize seem to grow everywhere; wheat flourishes best in the elevated downs near Warwick; cotton, arrowroot, spices, and other tropical and semi-tropical productions grow luxuriantly near the sea-coast or on the lower alluvial banks of the eastern rivers. Of the agricultural capabilities of the extreme north-west, and of the shores of the Gulf of Carpentaria, nothing is yet known accurately.

The quantity of land under cultivation is as yet miserably small, only amounting to one-seventh of an acre per head of the population; it is therefore not surprising that the importation of wheat and flour forms such a large item in the Customs returns. In 1861, there were about 400 acres under wheat, 2,000 under maize, 512 under potatoes, 400 under cotton, and about 600 under gardens and vineyards, besides smaller quantities under other crops. About 300 bales of cotton were shipped from Queensland in 1862, and an extensive stimulus has been given to its production by the superior quality of the fibre and the high price realized, together with the bounty offered by the local Government, which we took occasion to notice recently. The total quantity of land alienated by the Crown, since the formation of the Colony, is 80,486 acres. The average price of that sold in 1860 was £1 13s. 1d.

Whilst in 1860 there were only two towns—Brisbane and Ipswich—there are now six municipal corporations in existence; the whole population of the Colony, on the 1st of January, 1862, was but 34,367, and now is about 52,000 souls, not more than one of our large English

towns, and yet they raised a revenue of £204,000. Extensive improvements have already been effected in the streets and thoroughfares of those towns in which corporations have been sufficiently long in existence to have been able to get to work.

The returns of live stock are probably the most interesting and valuable which are compiled in Queensland, for they are the record of its wealth. There were at the close of 1861, in the colony, 28,983 horses, 560,196 head of cattle, 4,093,381 sheep, and 7,465 pigs. With such returns and so limited a population, there is certainly no fear of a scarcity of animal food, especially as cattle and sheep increase annually at the rate of 29 per cent. The wealth of Queensland in forest productions is scarcely to be estimated, most of her timber being of a kind exceedingly valuable for building and manufacturing purposes. There was a fine collection of 130 varieties collected by the colonial botanist, and 26 specimens from the northern districts shown at the Industrial Exhibition. The woods were well described, and the value of most of them had been scientifically tested.

The main staple export of the colony—wool—increases very rapidly. The export in 1861 was close upon seven million pounds, valued at £613,074, or an increase of nearly two million pounds over the previous year's shipments. Proportionally to the population this shows an export of 203½ lbs. per head, of the value of 21d. per lb. It appears that however fast the population has increased, the main export of the colony has increased 18 per cent. faster. If we compare the year's export of wool with the number of sheep, as collected by the census collectors in April 1861, 3,166,802, that would give rather more than 2lb. 2oz. of wool to each sheep. The centesimal increase in the export of wool in 1861, as compared with 1860, was 39·68 per cent.

Although in 1860 there were no direct exports to Great Britain, in 1861 they had reached the sum of £119,515, and this at the same time that the indirect exports through New South Wales actually showed an increase of £63,000. It is also a curious coincidence that both exports and imports have increased in exactly the same amount per head of the population, namely, £2 12s. 10d. per head; they already reach the very large amount of £20 13s. per head for exports, and of £28 3s. 3d. for imports. Victoria, with her export of gold, is the only colony that exceeds Queensland in the rate of exports per head of population, and no colony equals it in the rate of import per head of population. Nor does this enormous importation seem to have at all glutted the market, or materially lowered prices. This may be said of all the largest articles of import, with the exception, perhaps, of wheat and flour; and even in this case the reduction in price may be more attributed to gluts in the other Australian markets than in this one. The importation of wheat and flour in 1861 was 4,945 tons of flour, and 30,454 bushels of wheat, of which the estimated import value was £101,309; at the rate of £2 19s. per head of population, or at the rate of 322 lbs. of flour and very nearly one bushel of wheat per head. Estimating the bushel to weigh 60lbs., the actual quantity of wheat per head would be 53lbs. The statistical records of this young Australian colony form a most interesting study, and are unexampled for magnitude, as compared with the limited population. Ten years hence it will probably distance all its neighbours in its pastoral wealth, and in the value of its wool exports.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY COUNCIL: Wednesday, Feb. 3.—Present, Lord Feversham, President, in the chair; the Earl of Powis, Lord Chesham, Lord Eversley, Lord Tredegar, Lord Walsingham, Major-General the Hon. A. N. Hood, Sir A. K. Macdonald, Bart., Sir Watkin Wynn, Bart., M.P., Mr. Acland, Mr. Raymond Barker, Mr. Barnett, Mr. Bramston, M.P., Mr. Cantrell, Colonel Challoner, Mr. Clayden, Mr. Dent, M.P., Mr. Exall, Mr. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Holland, M.P., Mr. Hudson, Colonel Kingscote, M.P., Mr. Lawes, Mr. Lawrence, Mr. Randell, Mr. Rigden, Mr. Sanday, Mr. Shuttleworth, Mr. Robert Smith, Mr. Torr, Mr. Wallis, Mr. Burch Western, Professor Simonds, and Dr. Voelcker.

The following new members were elected:

Aldridge, John, 17, Cadogan-place, London, S.W.
 Anderson, James, jun., Hedley Hall, Gateshead
 Angus, John, Whitefield, Morpeth
 Biggs, John, Cablington, Leighton Buzzard
 Bolam, Harry G., Keverstone, Staindrop, Durham
 Brownell, Edmund J. J., East Boldon, Gateshead
 Browne, Samuel, Brockton, Shiffnal, Salop
 Burn, William, Broomhill, Acklington
 Burnard, Charles F., Compton Villa, Plymouth
 Burrell, John, 3, High Swinburne-place, Newcastle-upon-Tyne
 Butler, George Cooper, Stanford-place, Faringdon
 Cargy, Gilbert, Kiplin, Catterick, York
 Cobb, Frederick, Walton, Warwick
 Chittenden, James, Hope All Saints, New Romney
 Chittenden, John, Newchurch, New Romney
 Denton, J. Bailey, Stevenage, Hertford
 Garraway, Edward, Norcott Farm, Womersh, Guildford
 Gibbs, Thomas, Sawndby, Retford
 Grey, Charles G., Dilston, Corbridge-on-Tyne
 Griffith, John, jun., Trevorgan, Cardigan
 Hawdon, William W., Walkerfield, Staindrop, Durham
 Headlam, Right Hon. Thomas E., M.P., Gilmonby Hall, Barnard Castle
 Hedley, Thomas, Cox Lodge, Newcastle-on-Tyne
 Hesketh, Sir Thomas George, Bart., M.P., Rufford Hall, Ormskirk, Lancaster
 Hett, John, Gainford, Darlington
 Hodgson, John Geo., North Dene, Gateshead
 Hodgson, R. W., North Dene, Gateshead
 Houseman, John, M.D., 147, Percy-street, Barras-bridge, Newcastle-upon-Tyne
 Howsin, Daniel, Flintham, Newark, Notts
 Hunter, Patrick, Roden, Wellington, Salop
 Langdale, Sampson, Newton Red House, Morpeth
 Laverack, Samuel, Chapel Haddlesey, Salby, York
 Loesch, Heinrich, Cammerswalden, Hirschberg, Prussia
 Loxley, John Dingley, Charlton, Pershore
 Marshall, Rev. Charles, Ripley Court, Ripley, Surrey
 Mather, William, Hemscott Hill, Morpeth
 Morgan, Mathew, North Bondgate, Bishop Auckland
 Morrison, Charles, Baildon Park, Reading
 Neale, Charles, New Field, Newark
 Newton, Thomas H. G., Barrall's Park, Birmingham
 Nicholson, William, 4, Sussex-square, Hyde-park, W.
 Page, William, jun., Southminster, Maldon
 Peck, Edmund, Plas-y-Dinas, Shrewsbury
 Phillips, Richard, Brockton Grange, Shiffnal
 Plumtre, Charles J., Pedding House, Sandwich
 Polwarth, Lord, Mertown House, St. Boswell's, N.B.
 Purrott, Charles, 8, Park-street, Croydon, S.
 Richardson, John, Alnwick
 Robertson, John J. E., The Naish Farns, Christchurch, Hants
 Robotham, Ambrose, The Oak Farm, Drayton Bassett, Tamworth

Sharpe, Wm. Barling, Baker's Cross, Cranbrook, Kent
 Smith, John The Hundred, Romsey, Hants
 Smith, William, Chimhams, Farningham, Dartford
 Smith, William W., Colwood Park, Cuckfield
 Stephens, George, Cropthorne, Pershore
 Stephenson, Hugh, Throckley House, Newcastle-upon-Tyne
 Still, Henry Chelsham, Croydon, S.
 Stott, John, Bothal Barns, Morpeth
 Surtees, Wm. Edward, Tainfield House, Taunton
 Thomson, Wm. Cunningham, Dilston Haugh, Corbridge, Northumberland
 Ware, Rev. Charles, Astwood, Newport Pagnel
 Waters, Richard, Broughton, Stockbridge, Southampton.

FINANCES.—The Hon. General Hood, Chairman of the Committee, presented the Report, from which it appeared that the Secretary's receipts during the past two months had been examined by the Committee, and by Messrs. Quilter, Ball, and Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on January 31 was £1,467 12s. 6d. The balance-sheet for the quarter ended December 31, 1863, and the statement of subscriptions and arrears, were laid on the table, the amount of arrears then due being £574. Sixty-nine members have given notice during the past year of their withdrawal from the Society. The sum of £2,000 received from Newcastle has been placed on deposit with the Society's bankers.

DISCUSSIONS.—Mr. Holland, M.P., announced that Mr. Lawes would read a paper on Wednesday, the 17th inst., on Salt used as a Manure.

NEWCASTLE MEETING.—The Earl of Powis announced that a Local Prize List amounting to £410, and including premiums for Galloway Cattle, Border, Leicester, and Herdwick Sheep; Hunters, Roadsters, Ponies, and Agricultural Horses; Wool, and Butter, had been received. The Council ordered these additions to the Society's Stock Prize Sheet, which may now be obtained complete of the Secretary.

The Committee further reported that an ample supply of the best forage had been secured by Mr. Jacob Wilson. They recommended that the same amount of shedding be ordered as at Leeds. This report was adopted.

Mr. Brandreth Gibbs having moved that in future, after the Council has decided at what city or town the country meeting shall be held, the usual agreement shall not be signed until the stewards of implements or some one authorised by the Council shall have finally inspected and definitely selected the fields to be used for the trials of implements; and that the decision of the Council (at its May meeting) as to the place for the country meeting shall be considered as subject to the above being satisfactorily arranged, it was seconded by Mr. Fisher Hobbs, and carried unanimously.

Mr. Robert Smith moved for a Committee to consider the subject of "dates of calving" for the cattle classes, and was seconded by Mr. Hudson; the motion having been carried, the following committee were appointed: The President, Lord Tredegar, the Hon. Major-General Hood, Mr. Barnett, Mr. Clayden, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Holland, M.P., Mr. Hudson, Mr. Randell, Mr. Sanday, Mr. Torr, Mr. Turner, Professor Simonds, and Mr. Robert Smith.

A letter from the Secretary to the Treasury relative to a collection of sheep for his Highness the Viceroy of Egypt having been read, the Council appointed the President

the Hon. General Hood and Mr. Holland, M.P., a committee for carrying out the necessary arrangements.

The Council then adjourned.

A Special Council was then held by order of the President, when his lordship having announced the gracious intention of his Royal Highness the Prince of Wales to become a Governor of the Society over which the lamented Prince Consort had presided with so much ability, his Royal Highness was elected by acclamation.

THE CONSULTING ENGINEER OF THE ROYAL AGRICULTURAL SOCIETY.

[The following correspondence was read at the Monthly Council Meeting of the Royal Agricultural Society on Wednesday, but no further steps have yet been taken on the subject.]

Britannia Iron Works, Bedford, Jan. 29, 1864.

My Lord,—We desire most respectfully to call the attention of the Council to the following subject.

We have for some time past thought that a gentleman filling the important position of consulting engineer to the Royal Agricultural Society should be one who has no trade relations with those firms upon whose productions he is called upon to pronounce opinion, and whose business does not make him a rival of any of the manufacturers or engineers who exhibit at the annual meetings of the society.

In Mr. Amos' case, the fact of his being a manufacturer of engines necessarily brings him into competition with other firms.

It has come to our knowledge that of late the business transactions of Messrs. Easton and Amos with some of the competing firms have been of an extensive character, and we very respectfully submit that this fact alone should disqualify Mr. Amos for his position of Consulting Engineer to the Society.

We most respectfully urge the Council to take into consideration the subject of the appointment of a gentleman as Consulting Engineer who follows engineering as a profession and not as a trade.

We are persuaded such a course would be highly approved by the exhibitors of machinery.

We beg to append a copy of some letters which have passed between ourselves and Messrs. Easton and Amos upon this subject.

We have the honour to be
Your Lordship's most obedient servants,
JAMES AND FREDERICK HOWARD.
To the Right Honourable Lord Feversham.

Britannia Iron Works, Bedford, Jan. 21, 1864.

Dear Sir,—We venture to write to you upon a matter which has occupied our thoughts for some time past.

The course of the Royal Agricultural Society of England trials was concluded at Worcester, and another course commences at Newcastle: we and other exhibitors are of opinion that the time has arrived when you should retire from the position of Consulting Engineer to the Society. Among other reasons for thinking so, we may mention the business transactions of your firm with houses in the implement trade.

We remember that some time ago you expressed a wish, or an intention, to resign the office; we have therefore less hesitation in addressing this letter to you.

We refrain at this time from saying more.
We are, yours faithfully,
JAMES AND FREDERICK HOWARD.
C. E. Amos, Esq.

Britannia Iron Works, Bedford, Jan. 21, 1864.

Dear Sir,—We enclose you a copy of a letter addressed to your partner.

We are persuaded if Mr. Amos knew the feeling there is among the exhibitors in favour of a change, he would not hesitate about resigning.

We are, yours faithfully,
JAMES AND FREDERICK HOWARD.
J. Easton, Esq.

25, Russell Square, Jan. 23, 1864.

Dear Sirs,—I am in the receipt of your letter of the 21st inst., enclosing a copy of one from you to my partner, Mr. Amos, Sen.

I do not think your new views of the position of my firm with the Royal Agricultural Society will induce us to resign the office we hold, because there really is nothing new with us—we have, from the commencement of our association with the Society, had large transactions with many of the exhibitors, both in purchasing and selling, and I cannot see a reason why we should not continue to do so.

I am, dear sir, faithfully yours,
MESSRS. HOWARD. **JAMES EASTON.**

Grove, Southwark, S.E., Jan. 24, 1864.

Dear Sirs,—Having been ill some time I have not been much at the works lately, and the answer to your letter of the 21st instant has been delayed in consequence.

I have been shown your letter to my partner, and I think his answer is so much to the purpose that I have nothing further to add.

I am, dear sir, yours truly,
MESSRS. HOWARD. **C. E. AMOS.**

Britannia Iron Works, Bedford, Jan. 28, 1864.

Dear Sir,—We duly received your letter of the 23rd instant. Our views of the position of your firm with the Royal Agricultural Society are not new as you suppose, but it was only a few days ago that the fact of the business transactions referred to in our letter to Mr. Amos came to our knowledge.

We have for some years heard it rumoured that your firm had large transactions with one at least of the competing firms, but we did not know what truth there was in the rumour.

We are persuaded that neither the Council nor the public are aware of the transactions acknowledged in your letter of the 23rd instant.

We are, yours faithfully,
JAMES AND FREDERICK HOWARD.
J. Easton, Esq.

Grove, Southwark, Jan. 29, 1864.

Gentlemen,—I am in the receipt of your letter of yesterday.

I do not know what transactions you allude to in your letter to Mr. Amos, but the fact of our having business transactions with the exhibitors of implements at the shows of the Royal Agricultural Society cannot be new to you, for I find from our books that we have bought and sold implements from your works several times from 1851 to 1860, and if we could have sold more for you we should have had much pleasure in doing it.

We have had opportunities and pleasure in selling implements at various times, not only for you, but for the following firms, who are exhibitors, viz.:—

- | | |
|--|--|
| <p>Messrs.—
Clayton, Shuttleworth and Co.
Aveling and Porter.
Hornsby and Co.
Smith and Ashby.
Ransome and Sims.
Richmond and Chandler.
Garrett and Sons.
Dray and Co.
Barrett, Exall, and Co.
Hill and Smith.
W. P. Stanley.
Turner and Co.
Tuxford and Co.
Robey and Co.</p> | <p>Messrs.—
Burgess and Key.
Henry Clayton and Co.
B. Samuelson.
John Goucheur.
E. and T. Humphries.
W. N. Nicholson.
Cronkill and Co.'s (Trustees)
Amies and Barford.
Woods and Cockedge.
J. Hartas.
E. H. Brentall.
Mapplebeck and Lowe.
James Cornes,
and several others.</p> |
|--|--|

I think it likely, after seeing this list, that you must have heard it rumoured for some years that we have had transactions with more than one of the competing firms. I wish those transactions had been larger, for we should then have benefited the exhibitors more, as well as ourselves, without injuring the Society.

You say that you are persuaded that the Council is not aware of the transactions acknowledged in my letter of the 23rd instant; I do not see how you can state this, as you must be aware that, besides one of your firm, at least six or seven gentlemen from the different exhibiting firms have been at different periods upon the Council.

I cannot understand your object for writing such letters to us. You must have forgotten that we are not judges, and that the instruments introduced into the Society by us for testing

the various implements are so simple and effective that the exhibitors, as well as the appointed judges, can at once see the most useful machine, and this I am confident has been the means of enabling the makers to advance the quality of their manufacture to the present high pitch of excellence, and of improving the system of agriculture, not only of this country but of all the world, much faster than would have otherwise been the case. I am, gentlemen, faithfully yours,

Messrs. Howard. JAMES EASTON.

Britannia Iron Works, Bedford, Feb. 1, 1864.

Gentlemen,—We duly received Mr. Easton's letter of the 29th ult., to which we have given our best consideration.

The transactions alluded to in our letter to Mr. Amos had reference more particularly to the large number of pumps you are supplying for steam-ploughing and other engines going to Egypt.

One exhibitor we are assured has ordered from you some fifty pumps at about £40 or £50 each.

You appear to see nothing inconsistent in your position of Consulting Engineers in having these large transactions with the exhibitors. Suppose for instance we recommend the pumps of Messrs. Gwynne, and Mr. Fowler recommends your pumps, would not the circumstance, however disposed you might be to be unimposed, tend to place us at a disadvantage; we think so, and so we believe the public would think.

You refer to transactions you have had with our firm from

1851 to 1860. On reference to our books, we find that during these ten years a few things have been supplied to your order, but the transactions really were so trivial, that we had well nigh forgotten them, they amount to less than six pounds (£6) a year; we had no idea, and certainly did not infer from these exceptional transactions, that you traded regularly in agricultural implements.

With respect to the testing instruments introduced by you into the Society, whatever may be their merits, you certainly must admit that they have had no part in the perfecting of our productions, and we are inclined to think that the engine builders would no more give you the credit you claim for the improvements in their engines than would the builders of railway locomotives for the great improvements introduced into their engines during the same period.

As to your instruments showing "at once the most useful machine," you must have written these lines without consideration. Without commenting upon the many mistakes that have been made in the awards, we will simply remark that if your instruments possess the high qualities claimed for them, surely the Society may at once dispense with judges, consulting engineer, and the attendant expenses.

In conclusion, we have to inform you that we have addressed the President of the Society upon the subject of our objection.

We are, yours faithfully,

JAMES AND FREDERICK HOWARD.

Messrs. Easton and Amos.

THE FARMERS' CLUB.

THE MALT TAX.

The first monthly meeting of the Club for discussion took place on Monday evening, February 1, at the Caledonian Hotel, 3, Robert-street, Adelphi, the temporary Club-house pending the building of the Agricultural Hotel in Salisbury Square. The Chairman for the present year, Mr. Thomas Congreve, of Leamington Hastings, Rugby, presided; while the subject appointed for consideration was "The Malt Tax," which was introduced by Mr. J. A. Williams, of Baydon, Hungerford.

After a few introductory remarks from the Chairman,

Mr. WILLIAMS said: The subject on the card for this evening's discussion being simply "The Malt Tax," will admit of its being analyzed and discussed *ad infinitum*. But in the observations I intend making, I shall confine myself to three points, namely: The hardships the tax inflicts on the working population; the injustice it causes to the occupier of the soil; and the injury the public generally sustain by an augmented price of our national beverage, and in all probability of the animal food they consume. You are all doubtless aware that Sir Fitzroy Kelly has written to the late chairman of our Club, for all the information that we can give him respecting the result of feeding cattle, sheep, horses, &c., on malt, and (seeing the interest he takes in the subject on our behalf) I consider that we are in duty bound to obtain for him all that we possibly can; but at the same time it must be understood that the cause will not fall through our not being able to bring forward abundance of instances in which experiments have been tried, as the duty makes malt too expensive, and there are, consequently, but few of us inclined to try it, however beneficial it may be. There is no doubt that, as far as these experiments have gone, they show that it is of the greatest importance to the public at large; and it must not be forgotten that the Chancellor of the Exchequer told the deputation who waited upon him in April last, that if we could produce beef and mutton 1d. per lb. less than at present by feeding on malt, that would weigh very much with the Government in favour of its repeal. But, however much the Chancellor's argument (the only hope he held out to us of the repeal) should induce us to prove as strong a case in that respect as possible—however detrimental the restriction of the duty is, or may be, to the public generally, by prevent-

ing the feeding of our stock with malt, except so far as regards the injustice of this measure in these days of "Free Trade," as it is called, to the British farmer—I look upon this last division of the subject as quite unimportant in comparison with the other two, inasmuch as with the public it is a matter of taxation only, while in the case of the British farmer it is a rank piece of injustice; and as regards the labourer and artisan, it doubly affects them, morally and physically, or in other words, both in body and soul. With respect to the hardships the labourer and artisan have to contend with, we must look into their cottages, and contrast their present condition with what it ought to be, and see if we can lay the charge to the high duty on malt affecting their domestic comforts. To do this, I will picture what I consider ought to be the happy and comfortable fire-sides of our cottagers, and I trust that if we can get this obnoxious duty removed we shall soon see an approximation to such a desirable end. Look, then, to the future: fancy the duty abolished. Observe the young man who has just taken a wife; he sees the evil of the past, and wishes to steer for himself a fresh course; he finds, in these days of machinery and steam, that it is worth his while to become a first-class man, as he will thereby earn more money; he hires a cottage, and is about to become a family man; a pig fed from the offal of the cottage and garden, and perhaps from an allotment, and finished with two or three sacks of meal, graces the ceiling in the shape of two sides of bacon. A barrel of good wholesome beer, made from malt and hops only (as it would not pay to adulterate it), and served from the brewer (as it would not answer to brew it at home, and is much better and cheaper when brewed in large quantities), is to be found in the pantry. In the evening, after his day's work, whilst his wife is at her duty mending his clothes, or other work, he reads his Bible and his penny newspaper, smokes his pipe, has a chat with his neighbour, and has got a cup of good ale for himself and his friend, and Saturday night finds him by his own fire-side, making a better preparation for the Sabbath than we can point to under our present circumstances. Contrast this with the existing state of things, and say if such a case can be found, if it is not an exception to the rule. I happened to form one of the deputation that waited on the Chancellor of the Exchequer last year, and in the observations that I made to him I said it was a serious fact that out of the three classes of society—the higher, the

middle, and the lower—the two first having plenty of wine, spirits, and beer at command, it was patent to every one that the lower class, who had none of the necessaries of life at home, in the shape of beer as their national and natural beverage, were those who, as a rule, were most given to intoxication. And what is the cause of this? Why is it, that, taken as a class, we find them to be so? Surely, it is not their poverty that causes it, as by the retail method they obtain what they have: it costs them more than any one else, and consequently less must fall to their share. But is it not that, lacking the comfort I have described, as natural to us all, they go where it is to be had, namely, to the beer-shop or public-house. There, as we all know, they meet their boon companions: one pint calls for another, till this scene too often ends in drunkenness, and quarrelling is the result. Again, at what time does this happen? Generally, as a rule, on the eve of the Sabbath. When the workman takes his weekly pay is the time to settle scores, and to be jolly as I have described. But what a preparation for the next day! Is it any wonder that we find our churches and chapels so ill attended? Who form the bulk of our village population but the poor? and where are the majority of them to be found on the Sabbath day? Certainly not in the House of God; for, as regards the majority of our labourers, the words of the Psalmist, "I was glad when they said unto me, Let us go into the House of the Lord," in no way apply to them. Surely, then, if I have drawn a true picture (and I may appeal to you all whether in relation to your respective counties it is an over-drawn one), am I not justified in charging the laws of our country with respect to the "duty on malt" as the prime cause of this great evil? It falls doubly hard on the poor man, since, if he avoids the temptation of the beer-house, he gets but very little beer, and so suffers for want of it; while, on the other hand, if he goes where his market at present is, the sequel is too well known. To show that I am not singular in my opinion, I will quote part of a letter I have received from our valued friend Mr. Hudson, of Castle Acre. "If," he says, "the Chancellor of the Exchequer wants to punish the poor labourer, he cannot devise anything so bad as the malt-tax. There is no tax that so effectually gets hold of the labourer as the malt tax, for the working men are the great consumers of beer, and he who drinks the pot of beer pays the duty. The Chancellor gets the curses of the working people instead of their blessings; and well he may, when his vile tax prevents them from having their natural and national beverage—a pot of untaxed beer; and this is called free trade. Shame, shame!" I freely endorse these sentiments of Mr. Hudson, and proclaim, as a remedy against this great evil (which I trust I have faithfully portrayed), Repeal the duty on malt, abolish that pernicious system, that curse to society, the "license to be drunk on the premises;" and the day that the first barrel of beer enters the labourer's cottage the nation will have cause to rejoice! I had concluded this part of my subject when our secretary kindly sent me a "Prize Essay," written some eighteen years ago, when an attempt was made, as now, to obtain the repeal of the duty on malt; and as some portion of it well illustrates the position of the labourer, I will insert it here. The following is extracted from "Hansard," 1839: "Mr. D. W. Harvey, page 845, stated the words of a labourer, James Kershaw, aged 91, examined before the Poor Law Committee. On being asked, 'Do you remember the condition of the labourer during your life?' He said, 'Yes; when I was married, I could have a bushel of malt for 2s. 6d., and every poor person had a barrel of beer to drink instead of water; but it soon rose to 3s. 6d.' The question was put by Mr. Hodges, M.P. for Kent, 'Did the labouring man in former times used to brew as a general thing?' 'Yes.' 'How long have they left it off?' 'Ever since malt got to such a price that they could not buy it.' 'Do you know any poor man who brews his own beer now?' 'Not one.' 'Do you remember the rate of wages when malt was 2s. 6d. per bushel?' 'Yes, 1s. 4d. per day, or 8s. per week.'" The following two tables (extracted from the said essay, and which appear as if written for this occasion) will further show the injustice and hardship to the poor man. Speaking of the high-priced duty in 1803 having driven the poor man from his own barrel of beer to the alehouse, the author says: "And now let us see how this change operates to the injury of the labouring community. The average price of barley for several weeks past has been about 30s., but as inferior samples are included which are not used for malting, we shall assume 32s. per qr. to be the price.

Barley per qr.....	£1 12 0	
Malt duty per ditto.....	1 1 8	or 66 per cent.
Price to maltster	2 13 8	
Profit at 10 per cent.....	0 5 4	or 16½ per cent.
Price to brewer.....	2 19 0	
Profit at 10 per cent.....	0 6 0	or 18 per cent.
Price to publican.....	3 5 0	
Profit at 10 per cent.....	0 6 6	or 20 per cent.

Price to consumer

3 11 6	or 120½ per cent.
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on the quarter of barley. Thus does the labourer pay 120½ per cent. more than the original cost of the barley, owing to the malt tax. The following table will show the amount of duty paid at different periods by the labourer individually, and also by his family, estimating the latter at five persons—

Year.	Consumption per head. bush. gal.	Tax per bush.		Tax per head.		Tax per family.		
		s.	d.	s.	d.	£	s.	d.
1730 to 1760 ..	4 4½	0	6	2	3	0	11	3
1760 to 1780 ..	3 6	0	9	2	10	0	14	2
1780 to 1801 ..	3 0½	1	4½	4	0	1	0	0
1803 to 1805 ..	2 6	4	5½	12	4	3	1	8

We shall not carry this calculation any further, as we consider the labourer had now ceased to brew, and henceforth his consumption took place in the shape of beer at the alehouse, increasing the tax on him as already stated. But this table will show how cruelly the tax oppressed the labourer; for though he gradually lessened his consumption, the former still increased upon him, until, no longer able to bear up under the load, he abandoned his home-brewed beer in despair." I was truly glad to find such corroborative testimony to the observations I had previously made, although written some eighteen years before. The evidence of James Kershaw is most valuable to our cause. If you look at his age (91), and the time his evidence was given, (1839), it will show him to have been in the prime of life when the duty, in the year 1803, was at 4s. 5½d. per bushel; and he had too much reason to remember the cause of his ceasing to brew his barrel of beer. I will now conclude this part of my paper by reiterating the charge, that the duty on malt has been the cause of the altered circumstances of our labouring population. Next, as regards the injustice done by the malt-tax to the British farmer. Here, too, I have not to go far and wide for ample information. If our case were only this, that, having to compete with all the world, through a measure of free imports (falsely called "free trade"), we should do so unfettered, that no tax should be put on any one thing that shall hinder our labours, or prevent us from making the most of our occupation, and more especially that no tax should be placed on the raw material by which we can manufacture our goods, this would be sufficient to show the injustice done us. But, it is far from stopping here. If we feed our cattle with malt (instances of the benefit of doing so, I shall allude to further on), we have to pay a duty equal to two-fifths of the value of the barley, or in these glorious days of "free trade," we are prohibited from using it (Hear, hear)! I find, on looking at the returns in the *Mark Lane Express*, that in the year ending December 31, 1863, 65,054 quarters of malt were exported. Now, if malt is good as a condiment here, it is so abroad; and on what terms of equality do we stand with the foreigner, who gets the duty on these 65,054 qrs. of malt remitted, and can brew his beer and feed his cattle with malt untaxed, and then come into our markets and sell his corn at 1s. duty, and his cattle and sheep duty free (Hear, hear)? But this is not all. I suppose few people are aware of the quantity of beer that is sent abroad. The following statement will show the quantity exported in the last three years:

Years.	barrels.	at a declared value of
1861..	378,461..	£1,411,204.
1862..	464,279..	do. do. £1,594,308.

For 1863, we have only the returns to the 30th of November, which are 429,775 barrels, at a declared value of £1,539,199; to which I add one-eleventh part for the month of December, or 39,070 barrels, value £159,927, making 468,845 barrels, value £1,679,126. This shows an increase since 1861

of over a quarter of a million value of beer exported, where no duty is paid; whilst it has been a stationary matter at home ever since I can remember. I will suppose the duty allowed on this £1,679,126, value exported in the past year, to be one-fourth. The drawback will then amount to £419,781. To this add the drawback on the 65,054 qrs. of malt exported, £70,474, and you will find \$490,255, or nearly half a million, given to the foreigner, whilst the home producer and consumer are obliged to pay the tax. Free trade, this, with a vengeance! (Hear, hear, and cheers.) Another glaring piece of injustice, which has not yet been thought of, or mentioned that I know of (we are such famous creatures to carry weight), is this, that the duty, not being an "ad valorem" one, confines the manufacture of malt to the best description of barleys: the consequence is, that the whole of the best barleys are sure to be malted, and so returned in the *Gazette*. The present season is well calculated to show to all those farmers who hugged the malt duty as their friend (because, generally growing a fine quality, it gave them a monopoly in the market), the injustice it is to all those who pay tithes, or a corn rent. The harvest of 1868 was, perhaps, one of the most curious ever known. Several farmers in this room can say, "I never had such a beautiful harvest in my life; I never got the produce together so well, and with so little trouble or expense"; whilst others, myself among the number, can say, "I never had (with the exception of 1860) a more dilatory or expensive affair." The effect of such a season is, that while the Midland and Eastern Counties carried their barley without any rain, the whole of the West of England and the Northern Counties had their barley very much stained and sprouted. I have taken the trouble to ascertain from the *Gazette* the average price of barley from the 1st of September to the present time—twenty weeks; and I say those farmers who had to contend with adverse weather in getting in their barley crops will certainly not have much cause to rejoice that the malt duty, which renders their article almost unsaleable, or only to be disposed of at from 20s. to 28s. per qr., will be the means of their having to pay an average price of 38s. 8½d. per qr. on their tithes, and, where so rented, on their corn rents; in fact, were it not that a very large quantity of the second-rate and inferior barleys are ground up, and given to cattle and pigs—I know several who are thus feeding from twenty to three hundred pigs each, and others who are giving it to sheep and beasts—a brother of mine is feeding three hundred sheep with barley; not malted, remember; in these days of freetrade he is not permitted to malt it—I say, were it not for this, the glut on the market would be so great that the price would be whatever the buyer chose to offer. This of necessity affects the average price. I have of on heard it remarked that the tail wheat ought always to be sold, to keep down the average; but what is that in comparison with the barley trade, where not only the tail, but a class of second-rate samples to an immense extent are never sold, and consequently never go into the returns? The result is that we pay tithes, &c., chiefly on the higher-priced barleys, and the malt duty is the cause of it. This I think I can prove by statistics taken from the corn returns from the 1st of September to the 31st of December last, which we may fairly suppose to be the produce of the last harvest. The counties of Norfolk and Suffolk, which housed their barley without rain, have returned for the period I have named as follows: Norfolk, 358,083 qrs. of barley, at an average price of 34s. 5d. per qr.; Suffolk, 182,874 qrs., at 33s. 9½d. per qr. Now mark the difference. Wiltshire—my own county—has only returned for the same period 31,028 qrs., at an average of 38s. 8½d. per qr. There is a very curious fact connected with these figures, namely, that although the difference in the quantity of barley sold in these three counties for the four months named is so enormous as to amount to 11½ times the quantity in Norfolk and six times in Suffolk over that sold in Wiltshire, the average price varies but little; thus showing that the duty is the means of driving the maltsters into other counties and to France to obtain what they could not get in our own. But how fares it with the Wiltshire farmer? what position is he in? He has to contend against circumstances over which he has no control, against a law unjust towards him, by restricting the sale of his commodity, and making him sell his barley, if he sells it at all, at from 20s. to 28s. per qr., whilst his payments for tithes, &c., are, for the last twelve months, at the rate of 38s. 11d. per qr. the annual average, and 35s. 10d. per qr. the septennial one. I

have already alluded to the quantity of beer and malt exported during the past year, and the duty allowed thereon, amounting to nearly half a million. And I ask, is there any sense of justice shown in the foreigner being allowed the drawback and our being made to pay the duty? I have never, since the law of "free imports" was carried, brewed a bushel of malt. Like Samuel Jonas, of Ickleton, I look upon it as such a "scandalous shame," and as he publicly declared he would not pay for a licence to brew, when threatened with one by the Chancellor of the Exchequer; so I say, that I never have, nor will, brew a bushel of malt while the duty exists, with the so falsely called "free trade." What is the consequence? My men must have something to drink; so I give £1 per barrel for what they have. But it would be absurd to call it the essence of malt and hops (laughter) And it is certain that my labourers have, as Mr. Hudson observed, no reason to bless the Chancellor of the Exchequer. Were the duty off malt, they would have beer twice as good at the same cost. If the duty were, as it ought to be, abolished, the produce of our farms would nearly supply their wants. Malt would to a great extent supersede oicake and other foreign produce; and our labourers, who bear the burden and heat of the day, would have plenty of good wholesome beer, free from adulteration. The last part of this subject to be considered is the effect which the tax has on the public generally. And this depends chiefly on the view taken as to whether they have to pay an additional price for their meat or their beer through the imposition of this tax. There is no question as to the price of beer being increased to the public one-third at least; but how does the tax affect them with respect to the price of meat? As a matter of course, and as a rule, the cheaper cattle and sheep can be fed, the less money the public have a right to expect to pay for their meat, and, consequently, there should be no restriction as to the mode of feeding—no law taxing the raw material by which such beef and mutton can be made. Fortunately for the grazier, and unfortunately for the public, meat is now at a high price, and remunerating to those who produce it. But if there was taken into account the amount paid by the British farmers for 188,000 tons of foreign oilseed cakes, annually imported into Great Britain—for a portion of 1,401,603 qrs. of foreign linseed annually converted into English cake, and for about 3,000,000 qrs. annually of Indian corn and maize, to say nothing of locust beans, lentils, and a host of other feeding stuffs—all foreign productions—all this would make a wonderful drawback on the supposed profits of the farmer. The law of free imports has for the last four years, with three bad crops and one very excellent one, kept the price of wheat so low, that it is become a losing game to grow it to any great extent. The farmer naturally asks himself, what he can plant as a substitute? and looking at the immense sums paid for the foreign productions I have just quoted, he feels satisfied there would be no end of the demand for barley to any extent that it could be produced, if the malt tax did not prevent its free and unlimited use. But as it is, he finds the quantity required for malting limited to about 5,000,000 qrs. annually. However much the population has increased or may increase, he finds the law checking the sale of his second-rate barley, by preventing its use for cattle in its most nutritious and profitable form; and whilst he is in this dilemma, the public are paying a most serious price for the beef and mutton they consume. To show that it is no idle supposition that barley when changed in its nature from starch to sugar is superior to any other feeding stuff when mixed with other food, I will read to you quotations from letters that I have received from several of our most practical farmers who have tried it. In the case of the first letter, I cannot give the name of the writer, as he has requested me not to do so; but I believe you may entirely rely upon what is said.

Sir,—I am not accustomed to writing, but will give you the best information I can on the subject. In the year 1845 I was then malting by the river ———, when a very large flow overtopped the bank and got into the malt-house. The water being full of sand spoiled all the malt in the bottom floor, and made it unfit for brewing. Therefore I petitioned the Board of Excise, and by a great deal of trouble got off the whole of the duty. The quantity was about 50 qrs. It then became a question how I should use it. Having ten nice heifers I fed them upon it and, very much to my satisfaction: nothing could exceed them. They were killed in ——— by a most eminent butcher, who asked me two or three years after if I had any

more malt-fed beasts, for he never killed anything like them for quality. The quantity I gave each beast was a peck per day, dry, with a little chaff. I only did this about a month I then crushed it the same as for brewing, and mashed it with hot water, letting it stand about two hours, and when cool I gave it with a little chaff as before. The beasts were always asleep. I think there cannot be two opinions whether sugar or oil will make the best beef.

I will now read the other letters.

FROM MR. JOHN HUDSON.

Castle Acre Lodge, Brandon, Jan. 16th, 1864.

Dear Sir,—It is nearly eighteen years ago that I tried the experiment of fattening three Highland Scots upon malt, against three of the same lot upon barley-meat. The three fed on malt were decidedly the best beef when they went to London to be slaughtered. The six were selected from a lot of twenty, and were as level as we could select them, and I had them weighed alive when they were first put into boxes, and again when they were sent away to London. I enclose you the butcher's letter who slaughtered them; he knew nothing about as to how they had been fed. The result of my feeding with malt is to be found in the July number of the "Farmer's Magazine," 1846.

[Enclosure.]

"25, Newgate-street, London, July 10th, 1846.

"Sir,—Herewith I hand you account sales of your beast No. 1 to 6. Agreeable to your request I beg to say the beast 4, 5, 6 were of a very much better quality than the others; the grain was finer, and altogether of a superior description, fully bearing out Mr. Collins' opinion with respect to the quality. In addition to which, the above 4, 5, and 6 were purchased by one of Her Majesty's surveyors, and selected from the others without any knowledge that there was more than ordinary about them. The price also confirms our opinion.

"Most respectfully,

"WM. LAMB CURTIS.

"John Hudson, Esq."

FROM MR. W. M. SANDAY.

Holmes Pierrepont, Nottingham, Jan. 23rd, 1864.

Sir,—My experience extends over a number of years, but only to a limited extent in each year from the excessive price of the malt. In the loss of weight resulting from the process of mauling I might state that from the fact of the starch being converted into sugar lay the great secret of the feeding qualities of malt. I am quite of opinion that if the malt-tax were taken off, such a revolution in our "trade" would take place as we little think of. One great result would be the facilities we should have for growing beef and mutton at a moderate price. Linseed-cake would be greatly lowered in price, as well as all other articles used in feeding.

FROM MR. J. W. CASBY.

Willoughby House, Spilsby, Lincolnshire, 21st Jan., 1864.

Dear Sir,—I have much pleasure in transmitting you the particulars of my experience in the use of malt for feeding purposes. I find from experience in sheep farming in this district that we have been in the habit of allowing our sheep too free a use of turnips throughout the winter, the consequence of which is considerable loss from scouring and diarrhoea, more particularly in the early part of the season after first stocking the turnips. In order to counteract this effect, I commenced last winter feeding my ewes in a yard at night, and giving them about one pint of barley each, amongst some chaff, with straw, in hurdles, *ad libitum*. The total loss was about five per cent. up to lambing time, which commences with us about the first week in March. This season I followed the same course exactly, but have substituted malt for barley, and up to the present date I am happy to say I have not lost a single ewe, nor have I had any complaints of symptoms of abortion—the malt is passed through rollers the same as for brewing. I have also been giving it to my calves with a mixture of cut hay and cut straw; they use it with avidity, and are doing well. Last winter I lost nine valuable calves, which, I think, might have been saved by using a little malt; this winter I have not lost one. Prompted by the above successful experiments, I am now giving a little to my working horses, but the excise duty is a complete bar against the general use of malt. If we could malt our inferior and discoloured barleys without the inter-

ference of the excise, the Government would confer a benefit on the agricultural community; we could then use it for cattle in the ordinary course of feeding.

FROM MR. MANFRED BIDDLE.

Playford, Ipswich, Jan. 27, 1864.

Sir,—I have your letter asking for the results of my experiments in feeding cattle, &c., with malt. I cannot yet give the particulars, as the experiments are not concluded; but as I have frequently weighed the animals, as well as all the food that they have consumed, I can state that the result has most satisfactorily proved that a quarter of malt will produce more meat than the same quantity of barley. I can also add that, in all my experiments, excepting one, that the malt-fed animals have been the most healthy and regular in their feeding throughout. As regards feeding entire horses on malt, I have for many years used it for those animals, but only in small quantities—more as a condiment than as an article of food. The malt duty has effectually prevented my using it in any considerable quantity.

FROM MR. ROBERT P. TANNER.

Ogbourne St. Andrew, Marlborough, Jan. 22, 1864.

Dear Sir,—In reply to your inquiries respecting my feeding sheep with malt, I can say I gave my lambs a very liberal allowance of oilcake and brass mixed. This made them scour. I then discontinued the brass, and put malt. They took to it almost immediately, and I continued to increase the quantity till they went to the butcher, which they are now doing. The more they had, the firmer they kept and the more they improved; and not a lamb scoured afterwards. I believe malt to be a most valuable and safe article for sheep grazing purposes. I can positively say that, having obtained the malt free of duty, it is certainly the cheapest thing I have yet used for fattening sheep.

FROM MR. JOHN FULLER.

Boshamwell, Swaffham, Jan. 27, 1864.

Dear Sir,—I am sorry I cannot give you any positive information respecting the feeding cattle and sheep with malt, as the expense has always been too much. If the duty was off, I have no hesitation in saying that I should have this year consumed 300 qrs. of malt, as I am now consuming weekly 4 tons of linseed cake for beasts and sheep. Mr. Wallis, of Cambridge, has stated to me that he is perfectly satisfied of the benefit to be derived from the general use for feeding purposes of malt, as for the last four years he has given, one month previous to lambing, one pint of malt to each ewe; and that since he has pursued that plan, he has had but little loss in the ewes, and they come in full of milk; and lambs do well. At present, he says, he has a great many lambs; and they are fat and well. There is nothing, in my opinion, would be so great a boon to the farmer as repealing the malt duty.

FROM MR. CHAS. HOWARD.

Biddenham, Jan. 20, 1864.

Dear Sir,—I have never used any malt, nor do I know any one hereabouts who has; but unfortunately, last harvest, I had rather a large breadth of barley very much injured by the rain—in fact, fully one-third of it was sprouted, rendering it unuseable. I have dried it, at an expense of 2s. per qr., and am using it for both cattle and sheep. They are all doing excellently, the latter being entirely on wuzels. There is sufficient malt to flavour the whole food. I can assure you, clean managers are quite the rule. Of course, my consumption of cake is not half what it generally is; and this is what I think farmers require—to be allowed to make the best of their own produce, so that the expensive article of cake need not be nearly so much used.

FROM MR. E. W. CREWELL.

Havenstone, Ashby-de-la-Zouch, Jan. 21.

Sir,—I am sorry I cannot give you much information respecting feeding cattle with malt. I am a Leicester ram breeder, and always show at the Royal shows, with some little success. I never fed anything but sheep; and I can truly say I never found anything so feeding as malt, and nothing so wholesome if a sheep is a little out of order. They will always eat it; and I have found its effects most beneficial.

FROM MR. H. D. RAINCOCK.

Marden Ash Osgar, Jan. 28, 1864.

Dear Sir,—I have used many hundred quarters of barley (grown) for feeding, and also laid out in the purchase of malt-dust for feeding many a £100; but as to using malt, it is too expensive. As to malt as a fattening quality, I have no doubt its dust is so good and so liked by all animals, that in a few weeks you see the alteration in the animal's coat, a sure sign of doing well.

I have grown barley in the bays of two or three barns, and fed regularly bullocks and sheep, and they did well with it; but I tried the Excise to let me dry my barley so sprouted, but they would not listen to me, although I offered to dilute it with split beans. The difficulty in not being able to dry when grown, must be apparent to everyone; it very soon then begins to get mouldy, and the cattle reject it; but could I have malted it I would have put it in a chamber, and used it as required. Could this have been done, I should have saved some £300 a year buying oilcake; and 500 quarters of barley I used annually for fourteen years out of fifteen I farmed, would have gone half as far again, as malt, than either ground or wetted.

FROM MR. MAURICE MUMFORD.

West Creeting, Needham Market, Jan. 29, 1864.

Sir,—I have used malt only in a very small way, principally for cart horses, and to get young heaves into condition, as I considered it a lighter food, and more nutritious than any raw corn. I have occasionally used it for beasts, but the expense has always prevented my feeding with it to a greater extent than as a change of food when my animals have been at a stand, and I have quickly perceived a change for the better after giving the malt; and was the expense lost, I should use it to a much greater extent.

FROM MR. EDWARD STENNING.

Stratton House, Godstone, Jan. 27, 1864.

My dear Sir,—You have asked me for information upon malt for feeding purposes. I am sorry that I cannot give you but one case of my experience in feeding sheep upon malt; but I have no hesitation in saying, the great benefit and advantage I derived upon that occasion would induce me at all times, when fattening sheep, to give them a proportion of malt with the corn and cake. I have a small malting attached to one of my farms; in 1860 I got the duty returned upon 10 quarters of inferior malt; but I was obliged to make an affidavit that I had consumed it, which I did, and I can honestly say my sheep never thrived and fattened so fast as upon that occasion. I can fully testify that malt is more valuable for fattening sheep than any other corn; then again the malt combs and the ashes are also valuable, the former for feeding, and the latter for manure; wherever I used the ashes I always grow much finer turnips. I can see to a drill, therefore if we could get rid of this obnoxious tax I fully believe that double the quantity of barley would be made into malt.

FROM CAPTAIN DAVY.

Ross Ash, South Molton, Jan. 16, 1864.

Dear Sir,—In answer to your letter of the 9th of January, I beg to inform you, I have never used malt extensively: its present price prevents it. I have seen it used with the best results to finish off fattening stock and to animals a little off their feed, and if it were cheaper should prefer it to almost anything else.

FROM MR. E. G. LUXTON.

Brushford, near Wombourne, Jan. 25, 1864.

I have never used malt very extensively, but in the height of the season, when mares come very thick, my groom has asked for malt for a stallion; it is scalded by pouring boiling water over it, and when cold, mixed with the oats and beans. I believe there is nothing that can be given to a horse more nutritious than malt. I have never given it to other animals, it being too costly at the present price to pay for so doing; but I have no doubt of its being an excellent food both for cattle and sheep.

FROM MR. R. J. NEWTON.

Campsfield Farm, Woodstock, Jan. 30, 1864.

Dear Sir,—I am in receipt of your letter of the 23rd. In answer to your enquiry whether I have ever used malt for feeding purposes, I am compelled to say that I have not done so. Mr. John Hutt (of Waterston), a neighbour of mine, has used malt with the best possible effect in fattening horses for sale. He says he finds no food to keep horses in so healthy and thriving condition. I wish I could have given you more information upon the subject.

FROM MR. W. E. HOBSON.

Kettleby Thorpe, Brigg, Lincolnshire,

January 23rd, 1864.

Sir,—Respecting my feeding on malt; some time ago I was making up some sheep: I fed them with oilcake, split beans, white peas, bran and oats, and weighed them every week; they for several weeks gained no weight. I had heard of malt being good for feeding, so I began to give them malt, a quart a-day, and increased it to two quarts. The first week they gained weight. I continued to weigh them every week. They gained weight, and went on uncommonly well. I have given it to cattle, but not to a great extent, the duty being so high it's too expensive a feed. This season's barley I could only sell at 28s. per qr. of 16 st., its weight by measure being 15 stone 6 lbs.; the duty and malting cost 27s. per qr., so with duty and kiln-charges it costs cost. per cent. I think it would be a boon to the farmer if he could malt barley duty free for sheep and cattle.

FROM MR. WM. GULLIVER.

Swalcliffe, Stud Farm, Banbury, 28th Jan., 1864.

Sir,—From past experience, whenever I have found any of my animals debilitated, from whatever cause, I have always had recourse (judiciously supplied) to malt, having discovered that to be the most successful stimulant of any medicine or food I have ever given to them, and were it not for the high price (caused by the duty), would be more used by my neighbours and myself, and have no doubt that a great many weakly animals might have been saved had they been properly supplied with it. If the duty is repealed it will be more tested, and prove the above statement.

FROM MR. THOMAS JOHNSON.

Hatfield, Jan. 27, 1864.

Dear Sir,—Respecting the use of malt among cattle; I have given it to my entire horses, but only in very small quantities, in the season when travelling; but I believe it to be a very excellent food for any kind of cattle. The high price prevents its common use. If the malt-tax was repealed I believe it would be very much used.

FROM MR. W. H. NEALE.

Mansfield, Jan. 29, 1864.

Dear Sir,—My experience in the use of malt has been limited, owing to the high price, but as far as I have used it I am quite satisfied of its great value for getting horses into condition. I have used it now for several years for new calved cows after calving, through the expense is very great.

These letters afford conclusive evidence of what the result would be were we at liberty to do "what we like with our own." The writers are most of them known to the agricultural world as practical men, and nothing but this "vile tax" as Mr. Hudson calls it, prevents malt coming into general use. The table which I have prepared from the corn returns shows the position of the British farmer in another light; that whereas the amount of English barley sold during the past year, and entered in the *Gazette*, amounts to 2,487,661 qrs., the amount of foreign barley imported into Great Britain and Ireland for the same period amounts to 2,068,766 qrs., or within 418,905 qrs. of the whole of the corn returns. Surely, if we have to compete with all this foreign produce we require our markets to be freed from the restriction of this confounded tax (hear, hear.) I trust I have said sufficient to prove the damage the "malt tax" has been and is to the welfare of our country. The public at large are vastly injured

by it. The occupiers of the soil suffer from its injustice to an extent that no other class in the kingdom would submit to, and there is not the slightest doubt but it has been the means from 1803 (when James Kerahaw ceased to brew), of demoralising and corrupting the peasantry of England to an extent that is truly deplorable (Hear, hear.) And why should it be suffered any longer to exist? There is no man who can justify it, except for revenue; and will the country be so blind as to perpetuate such a blister for the sake of £5,000,000, which, I have no hesitation in saying, damages the kingdom to the extent of four times its amount? The loss of revenue was never considered when the customs duty was taken off corn. The revenue took its chance when the duties were reduced on the luxuries of the rich; the revenue was a secondary consideration when upwards of a million per annum duty was thrown off the paper manufacture; and I will venture to assert, that deprive the Chancellor of the Exchequer of the malt duty this session of Parliament, and he will have the ability and the tact to replace it to the satisfaction of the country at large (cheers.) At all events, we have a duty to perform (Hear, hear), and it is a straightforward and easy one if we are only united. We have fired the first shot, we are about to storm and besiege the citadel, and, as Sir Fitzroy Kelly told the Chancellor of the Exchequer, "We don't intend to raise the siege until he has surrendered" (cheers.) The course that we must pursue with our members of Parliament, is to ask them to demand of the Government "the total abolition of the malt-tax." Less than this will be of no use; the whole of the abominations would still remain, and we must tell those members who would represent our interest in the House of Commons, whether it be a Lord John Manners or a Newdegate, two men whom I highly esteem, or any one else, that unless they are prepared to vote that the whole of the tax be repealed, if no other candidate can be found to replace them at the next election, which is not far distant, some gentleman from the Manchester School shall be solicited to go the "whole hog" in "free trade" (laughter and cheers.) I fear I have occupied your time too long, and I will conclude by showing you the part I think should be manfully taken by every voter who has the good of his country at heart. The county of Berks—in which I am a small freeholder, and therefore consider I have a right to look to its representation—is at present represented by two would-be "freetraders" and one Conservative. Now, strange as it may appear, the only true "freetrader" is the Conservative, Mr. Benyon. On the convening of a public meeting, held last year at Newbury, on the malt tax, invitations were sent to the three members to attend. Mr. Benyon did attend, and took a noble part in favour of abolition. Letters of apology were sent by Mr. Walter and the Hon. P. P. Bouverie, to account for their absence. Mr. Walter, who went very fully into the case, regretting his absence on account of a previous engagement, gave us his views respecting the malt tax. I will quote a part of his letter: "The question is one of taxation. The malt tax yields more than five millions a year; if it is repealed, or materially reduced, how is the deficiency to be made up? Consider what Parliament would become if it were divided into a dozen separate cliques, each representing a different association based upon the repeal of some particular tax! Granting, as I do, that the malt tax is open to many serious objections, are there no others which might not with equal justice claim the attention of Parliament, with a view to their repeal? Is not the fire insurance duty a just object of indignation to all but those whose stock is exempt from payment? Are not the assessed taxes most inquisitorial and vexatious? Is not the income tax the subject of an annual debate, with a view to its readjustment, and would the public be willing to pay an additional fourpence in the pound as the price of getting rid of the malt tax? The malt tax is only another name for a tax on beer, which is at least as fit a subject for taxation as tea or sugar." Mr. Bouverie's letter is pretty much in the same strain, and I ask, what hope is there for our cause if we allow ourselves to be misrepresented in this way (Hear, hear). One would think, at least, that having been instrumental in carrying the measure of free imports, those gentlemen would be equally anxious to make free trade of it as respects the malt tax; but such is not the case, and if they continue to hold the same principles that they express in their letters, it does not require a prophet to predict their future fate (cheers). A more thorough agriculturist than both these gentlemen once represented the county of Berks in the person of the late Mr. Philip Pusey;

but he went over to Sir R. Peel on the question of the corn laws. Having done so, *he forgot to vacate his seat.* When the next election came, his constituents, who are now Mr. Walter's and Mr. Bouverie's constituents, prepared themselves in good time with another candidate; and before the day of election came, Mr. Pusey's agents told him with long faces that it was no use his contesting the county. And I think I can answer for the electors of Berkshire that no member will be returned at the next election who will not vote for a total repeal of the malt tax (cheers). Gentlemen, I trust that each of you will, in your respective counties, do likewise; and then, acting in unison ourselves, with the aid of the thorough free-traders in Parliament, we shall compel the Chancellor to yield to us this act of justice (cheers). It is well known that Mr. Walter is connected with the *Times* newspaper, as its proprietor; and a leading article will be found in the one for Wednesday last, Jan. 27th, attempting to ridicule the meetings at Market Bosworth and Leicester for the abolition of the malt duty. I shall make no comment on the article, further than to observe that it is a certain sign that the movement we are making to obtain the repeal of the malt tax is looked upon as a more practical scheme than usual, or the mighty *Times* would not condescend to notice it. Again, it is not surprising that the *Times* and its proprietor take the part they do, as they owe a debt of gratitude to the Chancellor of the Exchequer for the abolition of the duty on paper. I cannot conclude without offering my thanks to Mr. Corbet and the other gentlemen who have written to me on the subject, for the trouble they have taken. I sincerely hope that those who discuss this subject will agree with me, that a partial repeal, although it may add to the consumption of beer, will be of no service whatever to remove the evils which I have mentioned; and therefore, as we have been taught to "agitate," we will do so till we obtain the total abolition of the malt tax (cheers).

MR. FRANKER HOBBS said: Mr. Williams has occupied so much time with matters of detail, which were absolutely necessary in an explanatory statement with regard to that question, that I shall not detain you at any length with figures. But as an old malt-tax repealer, one who has acted very warmly and zealously in the cause for upwards of thirty years, I hesitate not to come forward on the present occasion. I commenced business as a farmer in the year 1830, when the farmers of England were busily engaged in making application to Parliament for the repeal of the malt tax; and even before that time I took part in the parishes adjoining that in which I lived, and at meetings held in the district, in getting up petitions for that purpose. We then thought that our exertions would soon be successful, and the staunch friends whom we then had in Parliament would carry repeal. One night, indeed, a motion for repeal was actually carried in the House of Commons; but Lord Althorp, who then filled the office of Chancellor of the Exchequer, succeeded in getting the vote reversed on the following evening. As time rolled on, we still anticipated that we should very soon obtain the repeal of this tax, and this Club in particular made every effort in its power to secure the object. In 1847 there was a meeting of the Club with a view to the repeal of the malt tax, when our committee did me the honour to appoint me Chairman of the year. We entered very minutely into the question of the injury done to the occupier of the soil, the labourer, and the consumer of beer; and in the same year a paper was not only circulated by the Anti-Malt Tax Society, of which I was a member, among the various farmers' associations throughout England, but was also distributed among the different polling and election places at that period. That paper (reading) was as follows:—

AN APPEAL from the TOTAL REPEAL MALT-TAX ASSOCIATION to the Electors of the Counties, Cities, and Boroughs, and the People generally of the United Kingdom.

BROTHER ELECTORS AND FRIENDS,—

For a long series of years the prosperity and comfort of the People of these Kingdoms (particularly of the Working Classes) have been most materially prejudiced by taxes pressing immediately upon the necessaries of life. Amongst all these burdens none have been so pernicious in effect, when viewed in all its bearings, as the Tax upon Malt. This Association was formed for the sole purpose of procuring its entire abolition; and as you will shortly be called upon to exercise that important trust, the Elective Franchise, we venture to remind you of the great evils

inflicted upon the toiling millions of this country (whether engaged in agriculture or manufactures) by the operation of the Malt Tax; and to convince you of the necessity for its Repeal, we request your calm consideration of the following reasons:

1. Because the Malt Tax falls principally upon those who are least able to pay it; contrary to the maxims of all great statesmen, that "Taxes should be levied upon the *wealth*, and not upon the wants of the people."

2. Because the comforts, habits, and morals of the labouring classes have been seriously deteriorated by this tax, raising the price of Malt beyond the reach of the labouring man, thereby preventing his brewing at home.

3. Because, from the high duty which is now imposed upon Malt, the consumption of beer—"the usual beverage of the people from the first dawn of our history," and the only nutritious one arising from the produce of our own soil—has been reduced from one pint, per head, *PER DAY*, in 1750, to one pint, per head, *PER WEEK*, in 1845.

4. Because a family of four persons, if now enjoying the same quantity of beer as formerly, would be taxed not less than *Six Pounds* per annum—a sum greatly exceeding any income-tax.

5. Because the large amount of this impost leads to evasion, and leads to the use of deleterious mixtures; consequently, occasioning many diseases, and enfeebling the physical powers of the consumers.

6. Because *UNADULTERATED* Malt liquor is recommended by the Faculty to the infirm and needy generally, and to mothers universally when nursing their infants; and the Tax operates most cruelly in lessening or prohibiting the use of this necessary sustenance during so peculiarly important a period, greatly increasing, especially in large towns, a fearful mortality, attributed to causes remote from the truth.

7. Because a free importation of corn from abroad being now established by law, it becomes a matter of justice and necessity, as well as of consistency, to abolish all duties on home-grown produce.

8. Because the leaders of all political parties in this country (including Lord John Russell, Sir Robert Peel, the Duke of Richmond, the Earl of Ripon, and Mr. E. S. Cayley) have admitted, that when Free Trade should be permitted in foreign produce the same principle must be applied at home.

9. Because the Malt Tax impedes and obstructs the growth of Barley, which, when malted, makes the best liquid food for working men, and an excellent solid food for beasts and cattle.

10. Because whilst the growth of wheat, which is untaxed, has doubled in produce in eleven years, Barley, being taxed, has remained nearly stationary, although the population has largely and annually increased.

11. Because, in consequence of the Malt Tax, the mode of cultivation is deranged, the *employment of capital and labour lessened*, and the produce of bread, corn, and animal food materially diminished.

12. Because the Tax, in curtailing the growth of Barley in these kingdoms, renders us more exposed to the pressure of famine, by preventing such increased production of grain and animal food, consequent to a more highly approved and better system of cultivation.

13. Because the tenant-farmers are not allowed to use their inferior barleys in the manner most beneficial to themselves.

14. Because Barley may be malted abroad free of duty; and cattle fattened thereon sent to our markets in competition with those fed at home, the feeders of which are debarred the use of similar advantages.

15. Because the Malt Tax is unconstitutional, as by its machinery excise-officers are enabled to force themselves into the house of any person malting barley, thereby rendering an Englishman's house no longer his castle.

16. Because hundreds of thousands of acres are now lying waste and uncultivated in the United Kingdom which might be made available for the growth of barleys, and consequently *THRUBBY* of other crops conducive to human as well as animal food, but which cannot be profitably cultivated at present, by reason of the injurious operation of this Tax.

17. Because the cost of collection and the drawbacks allowed upon the exportation of Ale and Porter very considerably diminish the sum of £5,000,000 (exact) by this Tax annually from the pockets of the people) previously to its reaching the Exchequer—the actual revenue gained being greatly disproportionate to the amount levied.

18. Because the abolition of this Tax would not only cause the whole amount of the duty (£5,000,000), but a very large share of the various additional charges attendant thereon, to circulate and flow into a better and more legitimate course, and these conjointly making a total of very nearly *double the above sum*, would enable the mechanic, the artisan, and the labourer to purchase more manufactured goods, and to possess more of the comforts and necessities of life.

BROTHER ELECTORS,—

For these and other reasons that might be adduced, we earnestly exhort you to support no candidate at the next election until you have previously ascertained his sentiments on this important subject.

To the Non-Electors of these kingdoms we also most earnestly

appeal, as you are the great consumers of beer, as well as excisable articles generally, who, as fathers, brothers, and relatives, cannot fail to have great influence, which we trust will be used effectually to promote the repeal of the Malt Tax, and thence probably lead to the abrogation of all excise duties levied upon articles of consumption which press unequally and unjustly upon the industrious classes of this country.

On the Part and by Order of the Committee,
HENRY CORBET, Secretary.
Committee Rooms, York Hotel, Bridge Street.
Blackfriars, London, March 31, 1847.

The document which I have just read shows, I think, that we were awake at that period. Now, gentlemen, I cannot consent to rest the case for the repeal of the malt-tax, as some of those who profess to be our friends in Parliament appear to wish us to do, and as the Chancellor of the Exchequer in effect told the deputation that waited upon him we should do, upon the merits of malt for the feeding of stock. That is indeed an important question; but surely with those who take up a public position as regards this tax, that is not the sole reason for coming forward to demand its abolition. As regards the value of malt for feeding purposes, I may remark that for a very long period I have been an exhibitor of stock—I was a much larger exhibitor some years ago than I am now—and for upwards of twenty years I never fed an animal for exhibition without giving it malt (Hear, hear); and it is well known that the great exhibitors of stock in the present day use malt, not only for horses—it is universally used for them—but also for bullocks and sheep. Mr. Booth, of Killerby, told the Chancellor of the Exchequer that he invariably used malt, and that he could not have obtained the prizes that he had done for his Shorthorns without it. I myself have also used it with great advantage. Let me mention one instance. Living in the county of Essex, I bred Southdown sheep. It was supposed that an Essex man would have no chance of obtaining a prize for such sheep from the Royal Agricultural Society; but when that society held its meeting in Norwich, I showed a pen of Southdowns. I gained the first prize of £40, beating the Duke of Richmond, a result which was owing mainly, if not entirely, to the circumstance of the animals having been fed upon malt. There were no sheep in the yard that looked so well; they had more of the quality of Leicesters than of Southdowns; and not only was the general condition of the sheep very fine, but the wool was also of a superior description. My noble competitor seemed quite to enjoy the beating which he got, and it was malt that won for me the victory. Any gentleman who is a sportsman must know that when he has had a long day with the hounds and his horse has seemed very tired, though the animal would not eat his gruel he would readily take a malt mash, and by that means I believe many a horse has been saved. You all know that when malt is used with discretion it is always found advantageous in the feeding of stock; and although we may not be able to show the Chancellor of the Exchequer any very extensive experiments which have been carried out with regard to the case of malt *versus* meal, or of malt *versus* oilcake, there is, I think, a unanimous feeling among the farmers of England, who have used malt more or less in feeding, that it is an article which ought to be at the disposal of the farmer for that purpose free from duty (cheers). Many years ago I bought a horse of a gentleman residing at Stowmarket, with which I afterwards gained a prize of the Royal Agricultural Society at Shrewsbury. After purchasing the horse, I asked him if he could give me any advice with respect to its management. He replied by letter, as follows:—"My experience in feeding with malt extended only to horses used for covering or getting up for sale quickly; and it is now some years since I left off, on account of the expense, the duty making the article too dear to answer. I used to give the entire horse you bought about a quarter of a peck per day two or three times a week in the season, and for a few weeks before the season commenced; for I always worked him on the land, except when travelling. I once used malt to great advantage, *barring the expense*, in getting a hunter into condition after an illness caused by inflammation. I remember the veterinary who recommended me to use it, said, the sugar in the malt would act well without being too hot. At other times I have used malt in small quantities when grazing horses, and found it answer well. I know of no one who could give extensive information as to malt for feeding purposes, its expense having been too great on account

of the duty. In the way I used it I considered it most useful as preventing the need of physic, which would have been more expensive; but, if it could have been had cheaper, I should have used it for its fattening qualities." This morning I received from a young man, who is a tenant of mine, the following letter:—"I am aware that you take a great interest in the removal of a burden which is oppressive to us. Imagining that any evidence we can forward you will tend to strengthen your case, and as little facts speak great truths, I will relate to you what occurred on my own farm only last week. I have one bullock that would not eat his meal, whether barley, bere, or wheat; nor did it signify in what manner it was served out to it, whether upon the Tiptree Hall or any other system. The thought occurred to me whether it would like malt. I gave it half a peck of crushed malt, which it ate immediately. I have since given it nearly a quarter of a peck of malt with bean meal, and it eats it as well as the rest; but I must state it will not touch the meal without the malt. Surely if we were to take a little trouble, and forward you such facts as many do possess as to the value of malt for feeding purposes, it would go further than signatures to a memorial, if well linked together, and placed before a Chancellor of the Exchequer by a deputation. We might plead three things: Let the stock have its untaxed food, the poor their unadulterated beer, and the farmer his right" (cheers). I believe I may say that in my immediate neighbourhood the farmers are unanimously, or nearly so, for the total abolition of the malt tax; and I think their feeling on the subject is expressed in the letter I have just read. As I said just now, in effect, we have worked time after time with petitions, with meetings, and with deputations; but as to petitions, however numerous they may have been signed, they have been of no use. In fact, I quite concur in the remarks which have been made by Mr. Williams this evening, that unless we press the matter upon our county members we are not likely to attain our object. Any one who takes the trouble to read what occurred at the meeting in 1847 will find that we used pretty strong language at that time; but that language appears to have been of little use, and the only course for us now is really to unite together, and go in energetically for the total repeal of the malt tax (cheers). I do not, as I said before, stand before you upon the feeding ground merely. I have advocated the cause for a long period, and I advocate it still, as the poor man's friend (cheers). I believe that that is the great feature in the case for the repeal of the malt tax—(cheers)—that that is what the English farmer especially feels in his breast in relation to this impost. Every man who is a well-wisher to his country, and who knows the state of the agricultural labourers, and what a curse the beerhop is all over England at the present time, should advocate the total repeal of the malt tax, in order that beer might be sold free from duty, and the poor man may be able to buy his beer as he now buys his bread. I shall never rest satisfied till that is the case. I have worked in my early days from morning till night with the labourers, and I know how great an advantage it would be, especially in harvest time, for such persons to be able to obtain a sufficient quantity of home-brewed beer. This is an advantage which the labourer cannot enjoy under the present system. Farmers generally have given up the brewing of beer in consequence of the tax, and the poor man has no opportunity scarcely of consuming his natural beverage. If the hon. member for Birmingham and other great agitators, who are seeking to set the labourer against his employer, and the servant against his master, knew the feelings of the labourers of this country on this subject, surely if they are indeed the friends of the labourers, instead of pursuing their agitation and diffusing their venom throughout the rural districts, they would come forward and assist in getting rid of the malt tax, and thereby of all the abominations which are connected with it. If they knew what is the effect produced by beerhops throughout the country; if they could see the poacher, the sheep-stealer, and the midnight-robbler assembled there, and if they were to partake of the deleterious mixture which is consumed under the name of beer, they would feel how great an injury the tax is doing, and join the movement for its repeal. I have touched very faintly upon the value of malt for feeding purposes, which is well known to practical farmers. Let me add, that I hope that if we should be compelled by the Chancellor of the Exchequer to rest the merits of malt on this point, we shall not be placed in the position that we were some years ago, when two Alderney cows were

placed in the hands of two scientific men, Dr. Thompson and another, and it was apparently forgotten that in the case of such animals we look for milking qualities and not for fattening ones. The whole country was humbugged by the course pursued by those two gentlemen, who were seeking the advancement of their own profession, and had no feeling for agriculture. If we are obliged to rely upon experiments of that kind, let them not be small ones. I should like to see some 500 quarters at least of malt free of duty placed in the hands of a committee of members of this Club, having a scientific man like Dr. Voelcker to guide them, and I have no doubt that if in that way the merits of malt were honestly and fairly tested, the result would be to show that they are much greater even than farmers generally believed. It cannot be supposed that we wish to feed our stock with malt only: we well know that animals require a change, and we have given them oats, with various other things which have come into use for feeding purposes. In conclusion, let me say that I hope the farmers will be unanimous on one point, namely, going in for total repeal and nothing short of that; and further, that they will also be unanimous in pressing the Members of Parliament who represent them to advocate that measure (cheers).

Mr. B. SIDNEY said: Sir, I do not think there can be the slightest doubt that the farmers of England, and especially those who are growers of barley, have an excellent case in favour of the repeal of a tax which interferes with their feeding stock in the manner which they consider most advantageous; though it does not appear that those who have recently taken up this question have much faith in that part of their case, for I observe that the Central Association for the Repeal of the Malt Tax has begun by throwing it over altogether. Neither can it be doubted that if the Chancellor of the Exchequer can be persuaded to give up a tax of four or five millions, that will be a great relief to the farmers and consumers of beer. The farmers who pay their wages partly in beer must be benefited by the repeal of the duty. I therefore think that in coming forward to ask to be relieved you are perfectly justified. The case is a very fair one, so far as you farmers are concerned; and the difficulty is how to weigh your case against other people's cases. As for that model labourer, whom Mr. Williams has described, sitting in a model cottage with his bible before him and his barrel of beer in sight, you have in all that one of those pieces of cant which are so very common in the present day. I do not believe in the existence of the animal.

Mr. WILLIAMS: He does not exist now.

Mr. B. SIDNEY: He does not exist, nor does he appear to have the slightest chance of existing (laughter). A temperance advocate, however, might say that he is far more likely to exist as a result of cheap tea and sugar than of cheap beer. There is one mistake made on this point, to which I cannot help referring: I mean the mistake of supposing that the labourer frequents the beer shop merely for the sake of a pot of beer. I see in this room gentlemen who have plenty of excellent beer and wine in their cellars, and yet spend a good many days in the year at hotels and clubs (laughter). Why? Because they like society. The labourer is also fond of society, and he goes to the beerhop because he can find it there; and until you provide him with some more innocent and equally agreeable resort, he will continue to go there. When people have got a good case, they should not spoil it by cant. If you meet the world with your case boldly, you have some chance of succeeding, but canting arguments only create disgust. I utterly disbelieve in the regeneration of the labourer by the help of cheap beer; and so do you all. The truth is, that in these days the poor man has been ridden much too hard. There is scarcely a question brought before the public, but, somehow or other, the labourer is mixed up with it. The truth is, that the object of the farmers in this case is to put a little more money in their pockets, and why don't they say so? In order to secure success in life, it is necessary that the desires should be somewhat balanced by the means. When gentlemen come forward to propose the repeal of the malt tax, they should first consider what means they have of getting it, especially as they have to encounter the rival claims of sugar, tea, and income tax. It is of no use for farmers to run hunting-beel about the country, and making themselves ridiculous, by ending with their noses in the cur without huntsman or whipper-in, as they did in the latter days of protection. If farmers come forward now on this question, they ought to determine to go

in and win (cheers). At the present moment the agitation for the repeal of the malt tax is a complete sham (No, no), as I will prove in a few words, before I sit down. In the first place, consider the formidableness of your opponents. If a reduction is made in the duty on tea or on the income-tax, the Chancellor of the Exchequer knows that if anything should occur to upset the balance of Europe these imposts can be increased. He also knows that if he once loses the excise duty on malt, he can never get it again (Hear, hear). That might be a very good thing for you, but it would not be for him. Let the malt tax once be repealed, and it would be lost for ever. Now let me ask you what kind of preparation you are making for the contest? There is an old saying that we may get everything by money and fair words. Where is your money, and where are your men? You have neither. Why, you had the other day a great central meeting for the repeal of the tax, and since the meeting of the three tailors of Tooley Street nothing equal to it has ever been seen (laughter). A very small party of gentlemen meet; they propose the repeal of the malt tax; they suggest that Sir Fitzroy Kelly should be requested to give up his attempts with regard to malt feeding; that a deputation should wait on the Chancellor of the Exchequer; that public meetings should be held throughout the kingdom in favour of the repeal of the malt-tax; and that petitions be forwarded to Parliament from every district. Now, to do all that would require, as must be evident to all persons who know anything at all about such matters, four or five thousand pounds. Some allusion has been made this evening to previous attempts. I think you will find that these attempts always ended in the honorary secretary or the honorary chairman being left to pay debts. What is done in the present case as regards the raising of money? The first gentleman—I don't wish to mention his name—answers for half a county with £225. Among them the speakers undertake to find the sum of £225 to secure the repeal of the malt-tax. Why, is it by such means that you can hope to pay the inevitable expenses of the agitation for such a purpose? (Hear, hear). The gentlemen to whom I allude subscribe so much for their respective counties. One subscriber so much for Sussex, another so much for Dorsetshire, and one brave man, Mr. Hivy, I think, puts down for himself £5 (laughter). With a thousand pounds you might do something. If you would only, before leaving this room, undertake to raise a thousand pounds, I should believe that you were in earnest in demanding the repeal of the malt-tax. Then again, as regards men, you have no more important people than Mr. Newdegate, who in fact is not with you, and Lord John Manners, who has not the slightest weight in the House of Commons unless it be in reference to the fine arts. Such being the case, how can you ask for the repeal of the malt-tax with any expectation of success? Remember that in making that demand you are asking the landowner to put himself in danger of having to pay more income-tax in order that you may pay less wages or make more profit. You may be very right in asking that; but, on the other hand, is he not very likely to refuse to incur such a risk? You cannot work this question politically without men of influence as well as money, and there is not one influential man in Parliament who has shown that he is prepared to support you. I was surprised to hear Mr. Williams speak as he did of the disgraceful event which occurred some years ago in the County of Berks—I mean the turning out of Mr. Pusey, one of the best, one of the most intelligent, one of the most sincere friends of the farmer that ever sat in Parliament. Why have you no men to support you on such a question as this? Because in that instance, as in many others, you were silly enough to turn out a friend, and put a dummy in his place (laughter).

Mr. P. S. FURNWELL (Chard, Sutton, Staplehurst) said: I am one of those unfortunate men who have just been compared by Mr. Sidney to the three tailors of Tooley-street (laughter). There are two difficulties which have been alluded to by that gentleman—difficulties we shall undoubtedly have to encounter—the want of money and the want of men. As to the money, that is in your own hands. Give it freely of your will; but at all events, though you may give grudgingly, let there be enough for the object. I admit, too, that the great men to whom Mr. Sidney alludes are wanting in this matter; they are wanting in their duty to you, wanting in their conduct as men of business, and wanting, apparently, in disposition to be of any use in the cause. Of all the men who put down their names as patrons of the society for the repeal of the malt tax, not one,

except Mr. Fielding, has done anything towards carrying out the object. They have given a vast deal of advice, but that is all they have done. We came to the conclusion that it was desirable that persons should go to different counties on behalf of the association, and endeavour to wake them up; but great men who represent farmers in Parliament threw a wet blanket over that mode of action, and seemed to think that it was like a man peaching over the manor of another. They still adhere to the principle that a man should not interfere in another man's county. The only way of remedying such an evil as that, is to tell the member of Parliament who takes such a view, that, if he persists, he must find some other house to sit in than the House of Commons (cheers). If you talk to such persons in that way, you will be attended to; but if you go on speaking to them in a namby-pamby manner nothing will be done. It was in the way that I suggest that the repeal of the hop duty was carried. That was a sectional matter, concerning especially the counties of Kent and Sussex—this is a matter which concerns the whole kingdom. We have gone to the members for Kent, and said to them—"Gentlemen, we feel, respecting this malt tax, very strongly; it is a matter which affects us very much, not only as barley growers, but also as hop-growers. The tax is a great impediment to the consumption of hops in this country, an impediment to the extent of 2s. 7d. upon every pound of hops grown, and if you don't try to get it repealed we cannot send you to the House of Commons. One of our members, a young man, adopted the course of meeting the Anti-Malt-Tax Association, and he knows perfectly well that his election for Kent in the next Parliament depends mainly upon his taking up this question boldly. In another case the question was whether Sir Edward Dering should come in, or a Tory of the old school, as great a Tory as I am myself. The Tory candidate declined at first to pledge himself to the repeal of the malt-tax, considering it ticklish ground to go upon; but he has since said that he considers the tax unjust, that the farmers of Kent unfortunately have great cause to complain of it, and that he is in favour of its repeal. If you go to work in that way, you will have representatives who are staunch in the cause, not such men as Mr. Walton and Mr. Percy Wallington, but men who will stand by you. I declare that if the greatest Radical in the House of Commons were to come forward to contest Kent to-morrow against three Conservatives, pledging himself to vote for the repeal of the malt-tax, and the Conservatives would not do so, Tory as I am—and I am quite as strong a Tory as Sir Norton Knatchbull—I would vote for the Radical in preference to the Conservatives (cheers). This tax interferes with our business, the period of the elections is coming, and we have only to make up our minds to use the powers we possess to secure total abolition (cheers).

Mr. T. B. DRING (Claxby, Spilsby) said: As we are nearly all cultivators of the soil, it may be assumed that what is for the interest of one of us in this matter is for the interest of another; but, however, the agitation may have arisen, whether from a hop-oust or from any other quarter, I do not think that if we had got the repeal of the malt-tax we should find any good in it. I think it is unfair on the part of farmers to threaten their county members that if they do not vote for that measure they shall not be returned again. It is my honest opinion that if the owners and occupiers of land in England, were polled, those who are for repeal would be found in a minority (Loud cries of "No, no.") By doing what I have just mentioned, you place members of Parliament in a most awkward position (laughter). I think we ought to send members to Parliament, if we have confidence in them, unshackled and free to vote for our interests according to the best of their knowledge and judgment when questions come before them. I think we ought not to threaten that we will not vote for them unless they vote for the repeal of the malt tax. I am not in favour of being harsh to gentlemen who are our faithful servants, and I do not believe there is any use in that. As to the question which has been raised to-night, whether or not malt would be found without the duty cheaper for feeding than oilcake, I do not believe it would be. You would have three tons of barley meal for the same cost as two tons of malt; and I question whether the farmer would not be found better for feeding purposes than the latter. Then as to the raising of the price of barley, I do not believe that if barley rose in proportion above other kinds of produce, more would in consequence be grown, and prices would soon

find their level with those of other kinds of grain. Hence there would in that respect be no use in repeal, in the end. Again, as to the labourer, I do not believe he would be benefited by repeal. The more drink a labouring man gets, in excess, the greater fool he makes of himself. Even now he goes into the public-house and gets drunk, and in consequence takes to robbery, or turns his wife and children out of doors ("Oh, oh!") Therefore, I think it would in many cases be well if beer was dearer, so that labourers would get less of it. In the case of a man whose wages do not exceed 12s. a week, I think that the money, instead of being laid out to any considerable extent on beer, should be spent on bread and as much meat and other necessities of life as can be obtained. As to the benefit which Mr. Williams anticipates for the labourers as a result of the abolition of the malt tax, I certainly do not believe that would be realized. If our friend Mr. Williams happened to turn his attention to the feeding of cattle with malt, and sent his fifty quarters of barley at a time to the kiln for conversion, he would soon find nearly all the teakettles in the parish smelling of sweet wort, and no long time would elapse before he would be very glad to revert to the old system of feeding his bullocks and sheep with cake. The duty on malt is a very serious amount, something like five or six millions, and it is well worthy of consideration whether, if it were repealed, the Chancellor of the Exchequer might not, after all, be obliged to impose a substitute for it which would press more heavily on farmers than the malt tax does. I may add that I do not see how the tax can be said to press more heavily on the farming interest than on other interests in the country. I believe the commercial part of the world drinks a greater amount of beer than any other part; and I don't think farmers have a right to call out, unless they pay a larger proportion of the tax than they ought to do; I repeat, that I do not think farmers should go so far as to threaten the county members, or harass the Chancellor of the Exchequer (laughter); and I do trust that the great advocates for the repeal of the malt tax will treat the question in a sensible manner (renewed laughter).

Mr. W. SPERRING (Kennet, Marlboro'), said: I am not going to follow the last speaker in what he has said on this subject; I put the question on the broad ground that it is a crowning principle of free trade that when farmers are called upon to compete with foreigners, they have a right to manufacture their own barley into malt in any way they please, free from any restriction whatever (Hear, hear, and cheers). It is for this club, and for farmers generally, to consider how this object may be best attained, whether in the way that Mr. Sidney has pointed out in his stirring speech, or whether by looking the question boldly in the face, and telling our county members that they must vote for the repeal of the malt-tax, or we shall find better men to supply their places. The question must perhaps be determined in the end by the conduct of the voters in the various counties, at the polling booth. Although I feel very warmly myself on this subject, yet I cannot help acknowledging that there is in many counties a great want of sympathy as regards this particular impost. It has arisen in this way: that the growers of the finer qualities of barley feel that they have now a monopoly of the market, and hence are interested in keeping down the growers of inferior descriptions. I think, therefore, we ought to appeal to a sense of justice in this matter: for if we cannot show that we are suffering an injustice, we are not likely to succeed. It has been said that there is cant in arguing this question as one that affects labourers. Now, whilst admitting and contending that the repeal of the malt-tax would be a great benefit to the tenant farmer, I maintain that it would also be beneficial to the vast labouring population of this country (Hear, hear). Mr. Fisher Hobbs has well pointed out that the present beer-house system does tend in a great measure to create drunkenness. I believe that the present heavy duty on malt tends also to encourage the manufacture of a spurious article, and that owing to this cause a vast amount of deleterious matter is thrust down the throats of labouring men, the mischief of which to their health it is almost impossible to exaggerate (Hear, hear). I may mention that there have recently been a number of mechanics, masons and others, at work in my parish, and while the cost of the bread which they consumed has not exceeded 8d. per man, some of them have been known to pay on Saturday night, out of 35s. a week, as much as £1 for beer and spirits. Mr. Sidney tells us that we should consider who are our opponents in respect to this

particular tax. I know it may be said that the repeal or reduction of the tea and sugar duties would be a great advantage to a vast number of people; but I think it ought not to be overlooked that, by taking off such duties, Parliament would be benefiting the foreign, and not the home producer (Hear, hear). I don't think it can be doubted, when we have to enter into competition with foreigners, that we ought to be able to cultivate any particular crops for which we consider our soil adapted; and if barley happen to be one of those crops, we ought not to be subjected to the disadvantage of a heavy duty. I cannot but regret that Mr. Dring should have used the arguments that he has done. The Chancellor of the Exchequer has certainly shown us very little favour as a body. He did not look to the advantage of farmers when he took the duty off paper and other articles. As I said before, what we contend for is the crowning point of the great measure which was carried by Sir Robert Peel. Let me here quote a few words from a speech delivered by the late Earl Fitzwilliam, when this question came before the House of Lords, in 1846. His lordship said he "had little doubt the next step in the progress of change would be an attempt to supply the country with cheap beer, by a reduction of the tax on malt. If this did not follow, it should. He was an advocate for free trade, both through better fiscal relations with foreign countries and freer exchange of home produce at home. Beer was as necessary for the population of the nation as bread; and if the Government, at the close of the session, would come down to that House and propose the repeal of the malt tax, he should indeed be glad. The present question, though one affecting hops, had yet a wider significance, and was connected with that of a free trade in corn. Surely his noble friend would admit that. The present question was but subsidiary to a change in the duties affecting foreign corn. If, then, the price of corn was reduced, and the price of hops also, barley should surely be allowed to pass into the hands of the consumer without the intervention of the exciseman." The amount of the malt duty is stated to be something over £5,000,000; but I presume that the cost of collection amounts to £1,000,000, and therefore if the tax were repealed the exchequer would not lose so much as many persons have represented (Hear, hear).

Mr. T. OWEN (Clapton, Hungerford, Berks), said: Ever since the corn-laws were repealed I have been a strong advocate for the repeal of the malt-tax. The tax is, I consider, a gross piece of injustice to the British farmer; and the repeal of it is his right as well as his claim (cheers); and I believe there never was a better time for going to the Chancellor of the Exchequer and the House of Commons to urge our case. Never was there a period when the injustice of the tax with respect to certain localities was more manifest. I am a grower of barley myself, and out of 800 or 900 quarters which I have produced, not 100 have been fit for malting. I am also a maltster, and have two hundred quarters of malt which I cannot sell. It is true that I refused a fair price for it; but judging from what I saw around me, I proceeded on the assumption that malt would be dear, and I have found myself with 200 quarters of old malt and 80 quarters of barley unfit for malting. What have I done under the circumstances? I have had recourse principally to the feeding of 200 or 300 pigs, which I have sold under 6d. per lb., and have now forty or fifty pigs that I cannot turn into money. As regards the feeding qualities of malt for bullocks and sheep, I would remark that no man living has had fair opportunities of testing them. I have had a little experience in this matter. In the year 1860, I bought 20 qrs. of barley, re-winnowed it, and having reduced it to 16 qrs. wetted, and the result was that, it having grown on a cold soil, that barley never sprouted, and became completely dead on the floor. Before it came to be dried off, I said to the exciseman: "This barley has not risen at all; what am I to do with it? I cannot mix it with any other malt. May I use it for feeding purposes?" The matter was afterwards mentioned to the supervisor, and the result was that an application was made to the Board of Excise in London, who consented that the article should be used for feeding without paying duty. I used it for feeding eight or ten beasts, mixing it with cake and sliced roots, and the animals ate their food much quicker and with greater benefit than they had ever done before. What I contend is, that if malt will improve the condition of our animals, we ought to be in a position to use it, for there can be no doubt the food must

be made more palatable and nutritious by adding malt; and the sooner an animal fills his belly, the more time he has to rest. That is our right, and I hope we shall insist upon it (cheers). As regards the labourer, notwithstanding what has fallen from Mr. Dring, I contend that the repeal of the malt-tax would have a tendency to keep the labourer at home with his family, and to teach him to find his greatest enjoyments in home comforts, by the side of his wife and children, instead of going to the public-house to get drunk. I am quite sure, too, that there has been for a long period a great falling off in the consumption of beer at farm-houses. As a maltster, I know that many farmers formerly spent as much as £40 a-year on malt; but now do not brew at all, leaving their men to drink water, upon which I am sure they cannot do a fair day's work; or to find their own beer, which is only to be obtained at some retailer of brewer's beer. All this adds to the monopoly of the great brewers and maltsters, and who are generally against the repeal of the malt tax. I, for one, am determined never to give my vote to any man who will not vote for a total repeal of the malt tax; for I see no reason why the poor man should not have a cheap barrel of beer, as the Chancellor of the Exchequer should have a cheap pipe of wine.

Mr. W. WALTON (Chawton Park, Alton) said: I have this year grown about three hundred quarters of barley, for which I could not obtain more than from 24s. to 28s. per quarter. I offered it to two large brewers at Alton, and they said they could not buy it on account of the malt tax, the quality being inferior. I am an old free-trader, but I must say that I do not think free trade is carried out by giving a preference to foreign lauds over our own (Hear, hear). Having read a good deal of what has been uttered at agricultural meetings, I must confess it appears to me that the Conservative members are greater advocates for the repeal of the malt tax than the Liberal members; but perhaps the reason is that they are looking forward most anxiously to the next general election (laughter). As between the malt tax and the income tax, I have no hesitation in saying that the repeal of the former would be a much greater benefit to the farmer than that of the latter (Hear, hear); and I believe that the only reason why the landed proprietors are opposed to the abolition of the duty is that they are afraid of having to pay a penny or twopence a pound of additional property tax. If this un-free-trade impost were repealed, farmers would be able to give their labourers wholesome beer all the year, instead of only in haytime and harvest. This boon would be the means of keeping them at home with their families, instead of resorting to beer-houses. The repeal of this tax is in the hands of the farmers of England, and I hope they will resolve unanimously not to vote for any candidate at the next election who will not pledge himself to vote for its total abolition.

Mr. J. NASH (Reed Court, Rochester) said: I hope I shall not be out of order in suggesting that a resolution should be passed on this occasion in reference to the subject under discussion. I am one of those who are for taking action in reference to the malt tax, and I think steps should be taken for convening meetings in every county. My friend Mr. Punnnett and I were engaged for many years in advocating the repeal of the hop duty; and therefore if we feel a little more earnest than some, you will perhaps forgive us. We have only just come out of that ordeal, but are quite willing to enter upon another, perfectly prepared to go down to the House of Commons and canvass M.P.'s for their votes in favour of the repeal of the malt duty (cheers). I know how the work can be done, and how it ought to be done, having myself visited no less than two hundred and fifty members on another subject. I would again suggest that some resolution should be passed this evening, which might tend to strengthen the hands of those who require assistance and support; and I am fully convinced that if we make out a good case, and place it forcibly before the Chancellor of the Exchequer, that right hon. gentleman will not only listen to us, but grant us relief.

Mr. H. COMBES said: With your permission, Sir, I wish just to say a few words on this subject. Some years ago I

assisted in spending two or three thousand pounds in endeavouring to obtain the repeal of the malt-tax, and therefore my experience may be of some use at the present moment. You are all aware that a new Anti-Malt-tax Association, of which Mr. Punnnett is the chairman, has been recently formed, and, so far as I understand the matter, everything is now to be played as it were into the hands of that society. I was secretary of the first association, and the result of my experience is that we did not fail for want of money, nor do I believe we shall fail now for want of it. It is men that are wanted to ensure success. I feel sure that the first agitation failed for want of fitting representatives in the House of Commons. My notion is that if the repeal of the malt-tax is to be obtained, it will be done with very little expense—that is to say, it will be through its being made a personal question rather than a public one. Let every man go home determined to speak to his own members in the way that has been suggested this evening, and the object will soon be accomplished. Mr. Sidney implied that the thing could not be done in consequence of the yearly tenure of land; but he contradicted his own statement by telling us that a former member for Berkshire was turned out because he did not represent the opinions of his constituents (Hear, hear). If the electors of Berks turned out Mr. Pusey on that ground years ago, why can not farmers now act in a similar manner in reference to the malt tax? I believe that that tax was never before so great a sore in the House of Commons as it is at this moment, and that certain gentlemen there have a very great dread of it. You have not yet obtained many promises; but turn to the meetings in Leicestershire, Nottinghamshire, or where you will, and you will see clearly how the question has to be put in order to attain the great object in view. I will only add that for some years it has not been the practice of this club to pass resolutions, it having been deemed best to let the opinions expressed at the meetings go forth without any such addition (Hear, hear).

The CHAIRMAN, in closing the discussion, said: I perfectly agree with Mr. Owen that we ought to demand the repeal of the malt tax as a right and not as a favour; and I for one would go for the total and unconditional repeal (cheers). I would not rest on the feeding properties of malt, valuable as they are. The truth is, that the farmers of England stand alone as regards taxation, foreign producers using their produce without paying duty, while they themselves have to pay a duty of 75 per cent. The malt tax is, I contend, a robbery of us, and I think we should combine together to turn out existing Members of Parliament, as Mr. Philip Pusey was turned out, if they will not really represent us on this question. Let members of this Club at all events go to their Members and say "Will you vote for the repeal of the malt tax? If not you shall not have my vote at the election."

Mr. WILLIAMS then replied: As regarded the imputation of cant made by Mr. Sidney, he observed that there was no greater enemy in the country to anything of that kind than he was. Mr. Sidney might, and probably did, ignore the Bible; but it was not cant to say that the Bible should occupy its proper place in the labourer's cottage, or that they should get rid of an evil which manifestly tended to demoralise the poor man. And with respect to the electors of Berks dispensing with the services of the late Mr. Pusey: it was a great fact (not to be lost sight of) of the power they possessed when they chose to use it. Mr. Pusey was rejected, not because he was a practical man, which everybody knew, but because politically speaking he was dishonest. In fact, nothing which had been said by Mr. Sidney at all invalidated the grave objections to the malt tax, and his speech was in fact so absurd as not to call for any further reply (laughter and cheers).

On the motion of Mr. Walton, seconded by Mr. Owen, a vote of thanks was accorded to Mr. Williams for his introduction.

On the motion of Mr. Butcher, seconded by Mr. Nash, the customary acknowledgment was made to the Chairman.

The proceedings then terminated.

INCENDIARISM.

"Old England for ever!" What? Can it be that glorious "Old England" we used to vociferate in the days of our childhood and youth? Can it be that glorious Old England, the pride of the world, the arbitrator of nations, the home of the alien, the bulwark of all that is good, and noble, and free, the bright abode of true religion, civilization, and liberty—can it be that this transcendently glorious Old England has so awfully sunk into the dastardly, base, and most un-English crime of *incendiarism*? Yes, we weep for our country—it is, it is! Surely "Ichabod" is not to be written upon our doors, upon the walls of our palaces "The glory has departed." No, assuredly not; but it is very humiliating, it is a national degradation, a woful lowering of our wonderful country in the eyes of the world. Yes, it may now be said of the crime of England, as of some other countries—*i. e.*, Spain has its stiletto, Italy its hordes of banditti, Russia its extortionate murderers, Ireland its agrarian outrages, England its *incendiarism*.

We had believed better things of our dear old country. About thirty years ago this same cowardly crime was as rare then as now. The whole kingdom was horrified at such wholesale and iniquitous wrongs, and at once its people rose as one man and put it down by the sheer force of popular indignation. It is with unmitigated sorrow we revert to the revival and great prevalence of this abominable offence—this fiendish wickedness; but it is to arouse the public voice we write. It is again to call forth the same deep-rooted and popular indignation, so that by this voice of the nation it shall be again redeemed from such condemnatory and damnable crimes.

We can scarcely write with our ordinary patience of this *incendiarism*—there is something so vile, so foolish, so ignorant, and so abominably reckless about it. In some cases it may take the form of revenge; in others a spirit of retaliation for some real or fancied injury; in others, of malice, personal or envious; in others, from jealousy or private pique; and in some few isolated cases, probably of treachery to the insurance company. Again, it takes the form of a love of the marvellous—a desire to create a sensation—a devilish hope or wish to enkindle a feeling of fear and dread, or to spread terror throughout the land, owing to some imagined public wrong, or to show what a destructive power the meanest vagabond can use when he so pleases. Again, it partakes of the lowest grade of motives. The half-witted rascal desires a "flare-up"; the selfish miscreant, for the poor pay and drink of beer he receives in extinguishing the fire*; the vile fanatic from some wretched idea of the inequality of God's gifts to men, and the poor share he himself has of them, or that the owner has too large a share—a superabundance which ought to be distributed to those more in need, or that if he cannot enjoy such benefits himself, no one else shall; and many fires have originated from mere love of mischief.

Be the motives never so bad, or never so absurd, there remains the indelible disgrace to England, and a most woful waste of property, by which no one is benefited, but all classes seriously injured. It is comparatively but a trifling loss to the fully insured (and no prudent man will live a day without taking this precaution,) yet he is greatly wronged. It is true he receives from the insurance office the value of his property destroyed, but

* An incendiary in Norfolk confessed to having kindled seven fires for the pay and beer he obtained in aiding to extinguish them.

there are many things he cannot restore—he cannot replace. Take a farmer's rick-yard and premises—all are destroyed through the act of an incendiary. The insurance agent only takes account of all property actually burnt; he deducts for salvage or property saved. There is no allowance for fences or other fixed property, not being buildings. Stock and implements, if insured, are of course taken into account in case of loss; but there is no allowance for loss of manure which his ricks would have yielded, or consumption by stock. Straw is paid for according to value, but the valuable pulse and chaff it yields for food on thrashing is entirely lost. His farm is for that year minus the foldyard manure, the most valuable of all manures. He has to purchase artificial aids at an expensive rate, for which the price paid him for straw is quite inadequate. He has also to purchase food and lairage for his stock, his horses, his pigs; or sell the major part of them, their food, &c., at market prices; while for what is burnt upon his own farm he is paid at consumer's value. Then there is the carriage and inconvenience of all these things to be taken into account, so that the actual loss sustained cannot be truly estimated. The farm will for a long time give evidence of the loss of a year's cropping, a year's muck; it shows all management out of order: "no muck, no crop." Take again the loss to the labourer: he is thrown out of employment, no stock to attend to, it being sold off, as no straw for the most part could be purchased, no thrashing and dressing, no straw-leading, no chaff-cutting, no dung carting—*i. e.*, fact, no winter work, and less summer work is the result. Then again, the loss of so much good corn, so much good food for man and beast: what a lamentable waste, wicked waste, a grievous sin! whilst the poor are crying for bread, and the labour of his hands is thus taken away. Verily, the incendiary has an awful account to render to Almighty God for such base dealings with his fellow-men, such gross sinfulness in the sight of God.

It is a much easier thing to write in dire reprobation of so vile a crime as *incendiarism*, than to show how it is to be put down. Nothing can do it but the force of public opinion, public indignation, public scorn. Religious teaching, secular education, moral influence, social and family ties—all have great power for good in common life; but how is the infatuated fanatic, or the utterly lost wretch who delights in such deeds, such demons of evil, doing deeds of darkness—how are they to be reached and reformed, or prevented in their doings? Government is ever ready with rewards for detection and punishment: associations and individuals (sufferers) do their best to aid in this respect. There is no lack of rewards on detection, nor inducements to watchfulness. The police, however earnest and indefatigable, appear powerless to stem the evil; detectives are equally at fault. This proves the absence of combination; there is no "splitting" to secure the rewards. The act of firing, owing to discoveries in combustion, can be so secret, so unobservable, that it defies detection. Few cases comparatively have been brought to light. Great severity should undoubtedly be exercised upon every convicted criminal. Careless instances of firing should be punishable. Every tendency or practice whereby danger is incurred should be punishable, *i. e.*, smoking near combustible materials; shooting near stacks or buildings; erecting chimneys or making fires, without due care and consideration, near to combustible matter—these should be liable to damages incurred thereby; care-

less servants, causing a fire through such carelessness, to be imprisoned. In fact, every precaution, every exertion, every inducement should be taken to prevent this dire evil from spreading, by severity both from carelessness and also from inconsideration—these, too, as well as the vile miscreant we have so feebly denounced. The public press should be loud in its denunciations of this crying evil; the pulpit should second the press, both in its preaching and its prayers; public societies should everywhere raise their voice, and continuously condemn it; the social circles, the parish meetings, the public schools, the Sunday schools, the clubs, the public everywhere, in fact, should in every possible way join with one heart and one voice to put it down. Who can pourtray this wretched

incendiary? He has scarcely a name or a being; he is a thing of utter worthlessness—a creature more devilish than human—a diabolical scoundrel, without principle, courage, manliness, or feeling; the enemy of his class, a cowering, crouching, crawling “scamp,” too cowardly to strike, too sneaking for daylight, lurking in gloomy darkness, even then afraid to do his satanic work; he is the lowest specimen of fallen humanity, worse than the midnight murderer, the fanatical assassin, or the prowling thief; a vile traitor to his country, and an arrant fool, destroying her wealth, even the very food he craves, pauperising her children, unsettling her people, reckless of consequences. From such misguided terrorists may it please God speedily to deliver us!

FARM WORK.

MANUAL LABOUR: ITS VALUE AND ECONOMY.

The labour of the farm may be practically considered under the several heads of (1) manual, (2) animal, and (3) inanimate. For the most part, the three are inseparably connected together, the work performed by the latter two—horses and steam, or other animal and inanimate powers—being carried out under the superintending co-operation of the farmer. Thus, horses require a large amount of manual labour in rearing them, and in attending to their daily wants, apart from the work of driving them in the field, and otherwise applying their power as an auxiliary at any operation, such as ploughing or carting. Similar data are applicable to the steam engine, for a large amount of labour is expended in its manufacture before it performs any work upon the farm; and, after it is fairly started, as in threshing or ploughing, a vast amount of manual labour is again required to keep it in repair and in active service. In these data there is involved a twofold rule, from which the labouring man himself is no exception; for, before he is fit to enter upon active service, no little toil and labour is spent in rearing him. In point of fact, man is the more costly of the three powers involved in our proposition. The farmer who concludes otherwise, or thinks little about it, can hardly be considered a sound, practical agriculturist.

What does it cost to rear a young farmer or a ploughman? This is one of those practical questions that requires a tangible solution. The young farmer or agricultural apprentice, when he enters the field for the first time, may be “a green horn;” but, unquestionably, he is no windfall from the clouds. If there is a landowner or a farmer in the kingdom so superficial in his views of things as to conclude that it costs the land *nothing*—absolutely nothing—to make an agricultural labourer, it is about high time he were returned to school again, to learn the A B C of his profession. Every practical man has it at his finger-ends, so to speak, what it takes to make a good colt; and those who pay special attention to this peculiar branch of farm practice know right well that it doesn't pay to rear bad ones; and even after the finest specimen of his noble race is fairly started in plough gear, “there ain't much over the value of the food consumed to the breeder for his time and capital.” We also know what a steam engine costs; but neither of these can be accepted as a practical solution of the problem at issue. The outgoings afterwards, it may likewise be observed, are also as “familiar to our mouths as household words;” for, at the year's end, the several accounts speak for themselves; and, were the cottage account presented with the ploughboy when he is first hired to drive the team, it would likewise tell its own simple tale; and a very touching story, in many cases, it would be. But this account being indirectly paid, it is not forthcoming. Did sound practice, or practice with science, admit of the too common process of guessting, an approximate estimate might easily be given as to the prime cost of the ploughboy. Thus, “A youth of fourteen, at so much per annum,” is a question that could be solved by any tyro; but practice with science permits of nothing of this kind; and when the problem is put in a practical form, as, for example, “This youth has actually cost his employer so much money indirectly to rear him,” a

series of questions naturally follows, viz.—1st: How much? 2nd: Has the farmer got value for his money? 3rd: What professional merit has he, as a farmer, in the rearing of what must always be acknowledged the most valuable stock upon the farm or in his employment—viz., the labourers and their families? 4th: Is the present the most profitable and economical system of cottage economy and farm practice for all parties that can be adopted? Or, 5th: Could landowners, tenants, and labourers improve upon the practice now generally pursued, so as to confer a mutual benefit upon each other, and upon the country at large?

Although the first of these interrogatories involves an unknown quantity, it is nevertheless manifest that young ploughmen are not reared for nought by their parents, any more than young farmers. Generally speaking, the indirect method of paying for things is acknowledged to be more expensive than the direct one. To this there are no doubt many exceptions, and the case of the ploughman's wife nursing her son may be instanced as one; for it is manifest that she does not receive indirectly full pay, according to the current daily wages of women, for her labour. At the same time, it is equally evident she is supported by the land, whether she resides in a cottage upon the farm, or in the village rookery, a long journey distant from where her husband is employed. It may no doubt be argued, as a set off in part, that she likewise employs a portion of her time at some branch of manufacture, as lacemaking, &c.; but the objection may or may not be valid, for those engaged in the manufacture and commerce of clothing, and other articles used by landowners, tenants, and the agricultural population generally, are indirectly supported by the land. It is commonly said that the whole rural population, including landowners, tenants, and labourers, are somewhat routine in their habits; but the old rule is not so generally applicable as it once was, for at the present time there is no little diversity in the way the money goes, so that the distribution of the produce of the soil is annually more and more complicated. But however landowners spend their rents, or tenants their profits, they have to rear more children than those of their labourers directly employed by them in the cultivation of the land, whether those children be reared upon the land or not. The town or village may be situated at a great distance from the estate of the landowner, and yet the inhabitants of that town or village may be wholly supported by the produce of that estate. In other words, the rookery is the landlord's and tenant's nesting-place for the breeding of their labourers!

Those who hastily conclude that the wages of the labourer is all they pay, and therefore if they clear their estates and farms of cottages, they consequently effect an economy of their annual expenditure, &c., pay less for rearing their labourers' children than were they resident upon the land which they cultivate, take a very short-sighted view of the subject, for they actually pay more for supporting them in the former case than they would do in that of the latter. It is an old-established legal maxim

that the agricultural labourer has the first claim upon the produce of the land, and it may not inaptly be said that indirectly the total expenses of labourers includes not only their wages, and the whole of the poor-rates, but also the greater portion of church-rates, taxes in support of the government of the country, profits of the villagers, &c., &c. All these data must be taken into account before we can estimate what it costs to make a young ploughman.

The second question is subject to a positive answer in some cases, but a negative one in others. Thus, when the farmer gets a good hand, he receives more than full value for his money; but when he hires a bad one, the reverse is his pecuniary position; and if it is granted, as we fear it must, that the latter is the more common one, the general conclusion is therefore manifest.

The third and fourth questions may be briefly disposed of together, the above general conclusion being the common key to both. Farmers, for example, can lay no great claim or professional merit in the rearing and management of their labourers. They may well boast of their improved breeds of cattle; but precious little has yet been done, generally speaking, to improve agricultural labourers morally or physically, or in any sense of the word. There are, we hope, a great number of exemplary exceptions to this general rule; but our village rookeries, bothies, and cabins speak for themselves in a language too familiar to the ear to be misunderstood. The present system, in short, is long way out of date; so that, instead of dwelling upon its shortcomings, the more advisable course is to set practically about its improvement.

Reduced to its simplest form, our fifth question may be thus put: *How can landlords, tenants, and labourers best pull together, so as mutually to advance each other's welfare and prosperity?* Leaving the former two—the landowner and tenant—to speak for themselves, let us examine the case of the latter—the labouring man.

In the first place, the difference between the wages of a good and a bad hand is not a fair index at present to the difference of the productive values of the work they perform. Thus, the former difference is seldom more than two shillings weekly where servants are engaged by the week, and from £1 to £4 when the term is annual. But all who know anything practically about the productive value of work done upon a farm must be perfectly aware that, were the bad hand paid, as he ought to be, according to the intrinsic value of his labour, he would, in the vast majority of cases, receive something less than nothing, the value of his work being estimated in comparison with the value of the labour of the other—the good hand. It follows, therefore, that we either pay good hands too little, or bad ones too much. The practical conclusion, therefore, in reference to improvement, is to encourage a superior quality of labour by higher wages; and *vice versa* to discourage much of that carelessness, profligacy, and bad workmanship that now prevails, by giving lower wages, and even allowances from the union, when bad health or misfortune throws labourers upon the resources of the poor rates for support. At present, on the contrary, we are actually encouraging not only a low standard quality of labour, but also idle habits and vices of every description. In a reformatory movement to obviate this, no class is more deeply interested than are the labourers themselves; but we regret to say that everywhere they are more than prone to preach up the common doctrine of equality, and for the simple, but humbling, reason—they have never been practically taught otherwise. A large quantity of work, hurried over in a very imperfect and even slovenly manner, at little money, is a too common rule on the side of masters who are, after all, generally behind their more intelligent neighbours. But, on the other hand, any gain thus effected is always sure to be something more than counterbalanced by the maxim of "do as little as possible," or "make the job last as long as possible, so as to keep us out of the union," on the part of labourers. In comparison with other arts, agriculture is no doubt peculiarly circumstanced as to the daily quantity of labour which agricultural labourers have to perform, they being obliged to do an extra amount on certain occasions, as in seed-time and harvest; but, with the progress of machinery and improved modes of farming, they are annually experiencing relief in this respect; consequently it is both their duty and their interest to co-operate with all improvements of this kind. They ought always to bear in mind that the ground was "cursed" for their sakes purposely to find them in

employment and bread—that they thus give their labour in direct compliance with a divine law; and as the object of their labour thus applied is to procure from the earth its produce, it follows that they also ought to learn how to apply their strength most efficiently, and be able to appreciate the effect produced by their industry, and consequently to estimate its value to their employers; for there is at the present day a growing desire on the part of the general public to estimate things at their true value, and pay for them accordingly, and this is evidently a movement in the right direction for every honest labouring man.

It would take a large volume to discuss in detail the *modus operandi* of applying the muscular power of man to the various implements of agriculture, so as to produce with each, in a given time, the greatest effect. Suffice it to say, at present, that the head and hands, or the nerves and muscles, both require training, and that the period of apprenticeship required to be served by an agricultural labourer exceeds that required to be served by apprentices in the majority of other arts or industrial occupations. Indeed, a very large number never attain to the mastery of their profession in this respect, being awkward all their lives at handling almost every tool upon the farm. The physical training of the nerves and muscles to perform their functions in the execution of heavy and light work is a branch of practical agriculture that has hitherto been greatly neglected. This has been attended with much loss to both employers and employed. It has also been productive of the grossest misconceptions imaginable on the part of the general public; for, while agriculturists have been sending their "halt, lame, and blind" to earn their bread at other branches of industry, those other branches, strange to say, have been labouring under the gross delusion that "any blockhead could be a farmer, and any good-for-nothing scowder or a ploughman!" But the experience of better informed and more enlightened times is now beginning to propound the very opposite of this antiquated credence as the practical rule. At the same time, much up-hill work has to be encountered in the moral and physical training of our rural population, before they can reasonably expect the dignified diploma of their profession.

It may be conceded, as a general rule, that, by the time an active, intelligent young ploughman is fully master of his profession, the question of a cottage and married life is on the rustic *tapie*. In other words, it is seldom that an agricultural labourer is fully master of the different branches of his profession before he has attained to about twenty-five years of age, at which period he is at least ripe for cottage-life at his own fireside. We repeat this a third time, because it involves very important fundamental data in the general question of cottage economy now under discussion.

According to the above data, when the ploughman gets married and enters upon cottage-life, his services are of the highest value to his employer. In other words, he is a better hand and a steadier and more trustworthy servant than when single, and therefore worth longer wages. These premises are generally acknowledged to be true, so that the conclusion of higher wages deduced from them must also in fairness be admitted, although the contrary is generally acted upon, the newly-married man having to pay rent for his cottage. In speaking from our own experience, we have no hesitation in saying that an honest christian young man, when he gets married, is worth a good cottage and garden upon the farm, rent free, as the increase of wages thus conceded on his behalf; and we are equally confident that, were such granted to properly selected hands, and the requisite attention paid to the moral and physical training of the rising population in connection with agriculture, the English village rookeries, the Scotch bothies, and the Irish cabins, now loudly complained of, would soon cease to be a national disgrace and a curse immeasurable to British agriculture; nay, more—for it would turn the greatest of present evils into the most propitious of future blessings.

There is thus no want of room for improvement, and means whereby it may be practically realised, to the great advantage of all the parties interested. That landowners would eventually receive manifold interest for their capital invested in the building of suitable cottages upon the farms of their tenants, to supplant the present village rookeries, which would gradually die out, is subject to easy proof; while their pockets would be greatly, if not wholly, relieved from the present continuous drain upon them, directly and indirectly, to sup-

port the present antiquated pauperising system of rearing the young, and supporting the old and the idle. That their tenants would gain a still greater advantage, is equally subject to a tangible demonstration. But it is to the labouring population themselves that the improvement would be felt a God-send by every Christian heart.

The dynamical effect produced by a horse has been variously estimated as equivalent to that of from five to seven men. Dr. Gregory, in his "Mechanics," and also "Mathematics for Practical Men," takes the mean of these two, viz, six men as the equivalent. On several occasions we ourselves have seen at ploughing-matches, in some cases ten men, in others twelve, and on one occasion fourteen enter the field in competition for the prize, and carry off the honours for time, finishing their land before any of the teams of horses or oxen.

Part of the strength of a horse being spent in its own locomotion, it is only the remainder that the animal can apply to the hauling of implements. Even in standing, no little muscular power requires to be used in preserving the equilibrium of posture. This is done by the contractile force of the antagonistic muscles of the extremities, the one set by pulling one way and the opposite set the other, keeping the bones of the legs between them as it were in an upright position. This, it may be observed, furnishes a very instructive practical illustration why a horse of good symmetry and mettle stands more securely upon his feet than the shapeless and unactive animal, and also at a less expenditure of muscular power and nervous action. It likewise exemplifies the advantage which a finely bred, muscular, light horse possesses over the heavy, clumsy animal over-loaded with fat and other fluid matter. This advantage is still more conspicuous when they begin to walk; the movements of the former being much more easy and elastic than those of the latter, there being not only an economy of muscular power and nervous action in favour of the light horse, but also of tear and wear upon the articulations.

The effective available power of a horse for farm work is inversely as his velocity or rate of progression. He can apply the greatest tractive force at a dead pull. This is illustrated by the breaking of the traces when his shoulder is first applied to the collar in starting the plough, the implement having become fast by the share coming in contact with rock, or a stone, or other hold-fast impediment. It has also been repeatedly proved by various kinds of experiments. It is this which enables the horse to start a cart or other vehicle from a state of rest. But when once started and in motion, the faster the animal walks the less available power it can apply in hauling; for there is a limit to its rate of progression when moving without a load at all, heavy farm horses being generally slow goers.

During the latter half of the last century and the early part of the present, numerous experiments were made in this country and on the continent of Europe, from which general rules were deduced as to the strength of horses moving at different velocities. Thus, quoting from Gregory's Mathematics for Practical Men: "From some experiments made by the Society for the Encouragement of Arts, under the direction of Mr. Samuel Moore, it was concluded that a horse moving at the rate of three miles an hour can exert a force of 80 lbs." Tredgold on Railroads, again, gives the maximum velocity of a horse when unloaded at 147 miles for one hour; but only 46 miles when the animal has to work continuously for ten hours. In ploughing land the draught of the plough will depend upon the nature of the soil and size of the furrow slice, and is ascertained by means of the dynamometer. The following may be quoted from an old number of the *Mark Lane Express*, in a tabulated form:—

Rate of Ploughing.	Time required to plough an acre.	Draught to plough.
Miles.	Hours. Minutes.	Stones.
1½	7 20	23
1¾	6 30	23
2¼	4 0	22
3¼	3 8	24

In another example it required a tractive force of 18 stones to draw an implement, when it was used as a swing plough, but only 14 stones when the wheels were put upon the beams,

the furrow slice being 5 by 9 inches, and the soil a friable one in both cases.

There is in this latter quotation, it will be seen, a difference of four stones, or nearly the ordinary draught of a horse, according to the above rate of the Society of Arts, for extra friction, to which special attention requires to be called, more especially as the difference was found to be imperceptible when the plough was worked with and without wheels in a heavier soil. It will also be seen that in both these quotations the actual draught of farm horses in ploughing far exceeds the book rules advanced by the old scientific experimentalists. Indeed, it is about high time that all such generalizing book-rules were sent to the dogs, for although they may embody a certain truth when generally understood, they are nevertheless fallacious the moment they are individually applied to the case of any one horse at work, either ploughing or carting.

Like ourselves, our working cattle do not always possess a uniform degree of strength; and, when individually considered, they are far from being equally affected by over-exertion, improper food, variation of the temperature of the atmosphere, or other causes that act upon the contractile force of the muscles, and the nervous action by which they are governed. Those who have any lengthened experience in the management of horses must be familiar with this variation in the mettle of their teams when in harness; and even when in the stable, animals frequently experience a degree of nervous and muscular inaction, not very easily described, their depressed and jaded condition in the morning before they are harnessed bearing a close resemblance to that of over-fatigue, after a heavy day's work in the field. Nor is this relaxed state confined to the muscles directly employed in hauling implements; for the wind, or organs of respiration, have much to do in the matter, a well-winded animal being for the most better able for his work than the contrary; and here it must be further observed that the normal play of the lungs may be affected by the collar or method by which the power of the horse is applied.

In practice, a horse power is thus a very indefinite quantity or measure of force available for farm work. Much depends upon the constitution of the animal, the quality of its food, mode of harnessing, and manner in which it is driven when yoked to the implements. To carry successfully into effect these several conditions, it is essentially necessary that the horses forming a team should be equally matched in every respect, properly fed, groomed, and harnessed, by a person who thoroughly understands their physiology, and who can control both his own temper and theirs; and when yoked, they should be driven at their normal pace or speed, and not overloaded when carting, or over-powered by too deep a furrow-slice when ploughing. The above data also explains the rationale why horses when heavily loaded or draughted walk more slowly than when the contrary, because at a slow pace they have more available muscular power to apply, and also a greater amount of gravitating force from their own "weight in the collar" (as it is sometimes technically termed), with which to overcome the resistance. The legs of the horse are so many weighted *ever-levers*, that are actuated by the muscles. The ground under each foot is a fulcrum, and the weight at the opposite end of the lever is the body of the animal. Such being the mechanical principle of motion, it follows that time is necessary to allow the gravitating force of the weight of the body to turn upon its pivot or fulcrum, in order to act in conjunction with the contractile force of the muscles; for were the rate of progression equal to that due to gravity, there would be little available gravitating force to apply. This is familiarly illustrated in running over soft ground, or skating swiftly upon ice—in both examples to prevent sinking.

The contractile power of the muscles of the horse is not yet so well understood as the gravitating force of the weight of his body in draught. Many experiments have been made purposely to arrive at satisfactory conclusions relative to the dynamical effect of the former, but they are all less or more defective, so that the question is still an open one. It would therefore be inconsistent with the object of this paper to drag the reader through the tortuous history of the past, or to enter upon the prospects of the future, however promising they may be. Suffice it to say that the strength of the horse is capable of being cultivated and greatly increased by proper food and management, while this increased muscular power may be economised in its application, or the contrary.

The physical training of our working cattle, so as to increase their strength and usefulness to a maximum, is a very important practical problem. We have attained to a very high degree of perfection in training our race-horses, our ropedancers and other athletes; and why not be equally far ahead of the world in cultivating the muscular development and strength of that most useful servant-of-all-work, the farm-horse? No doubt, in a certain sense, the question may be said to be solved by every practical agriculturist, less or more successfully, every day. This may be granted, and something more; for farmers generally are familiar with the fact that their teams, when properly fed and managed, are able to do more work than when otherwise treated. But this, when closely examined, rather resembles a systematic, routine from of jumping successfully in the dark, than the experimental solution of the modern question of Practice with Science. It may be perfectly true that a few bruised oats and beans, well mixed with the chaff, improves the mettle of our working stock, while a bellyfull of soft food produces the contrary effect upon the dynamical power of nerve and muscle; but the above golden motto of the Royal Agricultural Society demands the reason why; and this, too, is absolutely necessary to be known, in order to attain to the practical solution of our proposition—viz., the maximum degree of strength and usefulness of the horse. Again, farmers are also familiar with the fact that, however well fed and managed certain animals may be, they remain far behind their more healthy and athletic companions, as to the amount of work which they are able daily to perform. And what is deserving of special notice is the great diversity of ability that exists amongst this awkward squad, some of them being dull, soft, slow-goers, while others are the very reverse, being hasty, headstrong, and precipitous, as it were, for a short time, but before the yoking is half over they are "knocked up;" and between these two extremes of nervous and muscular action, there are others that exemplify a wide diversity of character—animals that are not included in the best class. They are generally defective as to symmetry and muscular development; but defects of this kind are by no means sufficient to account for the diversities in question, for they include very many horses of superior symmetry, while, on the other hand, some ugly animals are able to go through a vast amount of hard work, being "made of fine stuff," as it is sometimes said in practice.

The popular expression *made of fine stuff* evidently involves the key to the practical solution of the problem. Thus we see the value of the fine nerve and muscle of the stag and fallow-deer, and also of the Arabian and our best race-horses and hunters. The development of an excess of fat

and other fluid, so prominent in the heavy dry horses of London, and which many old-school farmers and ploughmen delight to see exemplified in their own teams, is not indicative of health, strength, and continued action, but the contrary. Such animals may take a heavy pull for a time in a cart or waggon, just as jumping upon a light horse's back will sometimes enable him to get out of the rut, or over the stone, when otherwise he would stick; but these are efforts of short duration, that are always attended with longer periods of greater relaxation, which require a corresponding amount of comparative rest to enable the nerves and muscles to regain their strength. But such alternate movements and rest are incompatible with the more active and continuous operation of farm work. Hence the growing change to a lighter and more active breed of horses, which has recently been taking place at the instance of the best of all teachers, EXPERIENCE.

The other half of the general proposition relative to the economy of muscular power is exemplified in the experiment already quoted, where the draught of the team was increased four stones by the removal of the wheels from the plough. This is only one of many similar examples that might be advanced in proof of the proposition, were it necessary. In this case the draught of the plough with the wheels was 14 stones, without them 18 stones, the latter giving an increase of draught to the horses of nearly thirty per cent. How was this done, seeing the implement was reduced in weight? Simply because of the adverse force of the ploughman at the handles, and the manner this adverse force placed the working parts of the implement, as the share, coulter, turnover, &c., in contact with the small stones, soil, and subsoil that formed the resistance to be overcome. Again, going faster at times than the normal paces of the horses, involves a sacrifice of muscular power. Working overtime is another, because under such a condition the waste upon the muscles exceeds the reparative process to such a degree as to reduce their available strength for hauling, while overtime is too frequently also attended with a deficiency of aliment. Defects in the mode of harnessing form another plan that may interfere in various ways with the economy of power. Thus the snail may pull at too high or too low an angle, or the collar may prevent less or more the free play of the lungs and the oxygenation of the blood, and consequently the supplying of the muscles and nerves with pure blood for the alimentary process. Improper food, bad grooming and household accommodation are somewhat similar in their action to the last, as they affect the purity and quality of the blood. And the last we shall notice is the putting the team out of temper by high angry words in driving, which is, perhaps, more ruinous than all the other put together.

THE EARL OF ERNE AND

The Earl of ERNE recently met the tenantry on his Lisnaskea estate in county Fermanagh, when he addressed them on various subjects connected with agriculture. On the subject of flax cultivation, he said: I wish to call your attention to the cultivation of flax. My agriculturist, Mr. Weir, from Donegal, is present, and will be able to tell you something of the cultivation and management of flax. I did expect that M. Von Belle, a German, would have been present; but as he has not favoured us with his presence, I will read you a letter which has been received from him, the facts contained in which cannot fail to be worthy of your careful consideration:—

"Lifford, Dec. 31, 1868.

"MR. WEIR, BALLINDRATT, SIR.—I beg to give you a statement of my flax crop this season. I had 2a. 2r. 20p. under crop, which yielded me 24 cwt. 2 qrs. 20lbs., which paid me £80 15s. I am not the only one that was benefited by the flax crop, as I paid in my office this day a small farmer the sum of £18 2s. 6d., being the produce of less than half an acre of land.

"In general the farmers about here, and in other places, are well satisfied with their flax crop, which is the only crop that has paid them for the last few years.

"I am, sir, yours, respectfully,

"Mr. Weir."

"A. B. VON BELLE."

THE CULTIVATION OF FLAX.

That man is a tenant of mine. He does not possess a very large farm—some forty or fifty acres of land; but he is a large flax buyer. He buys, say, a couple of thousand pounds' worth at a market—and if you have plenty of good flax to sell he will come over here and buy it from you. The people in this part of the country bring the flax to him to buy, without bringing it to any one else, in preference to huxtering it in any way. Any person that is my age, or who is older than I am, cannot but recollect what the flax crop used to be. You remember when everybody wanted to grow as much flax as they could in their own household—that the old women used to weave it. But, as you know, cotton has taken its place. The America war has caused a great dearth of cotton in the country. Last year you heard that the Lancashire mills were stopped, owing to the want of cotton, since when they have got a partial supply from other sources, in consequence of which the mills are at work again; yet, still there is a long time before them ere they will be able to obtain the supply they had. In the next time, we should make our fortune by growing flax on a more extended scale than we have done, inasmuch as, I think—least so far as I can see—we may look for some time to come to realize a high price for flax. And not only that, but I am told that they are making more linens than they ever did formerly. The manufacturers are going ahead, and they are

making linen much cheaper than they did heretofore. How is it they are able to make linen much cheaper than they used to do? I am unable, at this present moment, to explain; but that they are doing so is beyond all doubt, and from what I can learn, linen will vie with cotton in a short time, and flax will always be a crop that will pay in Ireland. The merchants, not like us who are ever plodding and continuing in the one path, are always looking ahead and feeling their way as to what will give them most money. As far as I can see, and judging from careful observation made on the subject, flax will pay better than any other crop. The soil suits flax; the climate suits flax. We have mills in this country for the scutching of flax; we have markets for the sale of flax. I perceive from the public papers that they are holding meetings in a great many towns in the south of Ireland for the purpose of endeavouring to force the people to grow flax. No doubt it is a dangerous crop to force farmers to grow, and so far as I am personally concerned I have no wish whatever to force you to grow it. It is a nice crop, and if any one misses doing any one of the different things to be done, the whole is lost. You will hear from Mr. Weir the difference there is between bad and good flax, and any step that is taken in the cultivation of flax, if it is not well done, is of no use. I intend to put up in each townland two or three copies of instruction for the growth and management of flax, in which will be set forth instructions for the formation of flax ponds, the preparation of the soil, the manuring, and so on. They will be posted up in certain houses in each townland, where you can always have access to read them; and all I ask you to do is, to study these instructions, and go as near as you possibly can to follow them out. I believe that Riga seed is the best you can have. I will get the seed from a wholesale establishment, and everybody who wishes to sow flax must give notice to the bailiff, and state how much land he intends cultivating. When he does that he will prepare his land, and give notice to the agriculturist to come and ascertain that it is in proper order for sowing; for there is no use in putting it into land that is not properly prepared for it.

Mr. WYLLIE, on coming forward, said: Flax, from the nature of its roots, penetrates deeply into the soil, and the moment it touches the cold, wet subsoil, its growth is checked, it becomes stunted, and fails to gather such an amount of fibre as will make it a profitable crop to cultivate. The land must be in good condition, not by the direct application of manure to this crop, but by the previous enrichment of the soil during former crops. The subsoil must not, however, be too loose, but dry and firm, otherwise flax will grow soft and branchy, producing fibre of poor quality and rough. If Dutch seed is used, about one-eighth less seed is required for the quantity of land sown. The best soil to grow flax on is sound, dry, deep loam, on a clay subsoil. Gravely lands are not suitable for flax, neither are light, boggy holms; in wet seasons flax is often produced on dry sandy lands. The best state of the land for flax is either after lea from which one crop of oats has been taken, or after a grain crop which has followed a crop of well-cultivated and well-manured potatoes or turnips. The rotations may be: Where flax follows a grain crop after lea—1st year, potatoes and turnips; 2nd year, grain crop with grass seed and clover; 3rd year, hay and soiling; 4th year, pasture; 5th year, oats; 6th year, flax. When flax follows a grain crop after potatoes

and turnips—1st year, potatoes and turnips; 2nd year, grain crop, wheat or oats; 3rd year, flax, with grass seed and clover; 4th year, hay with soiling; 5th year, pasture; 6th year, oats. The 7th year commences the same rotation again. Flax may be sown any time during the month of April or even the first week of May; but the second and third week of April is the proper time. Riga seed is the best kind to sow on moist soils, and the quantity usually given is 32 old Irish gallons to the Cunningham acre; this is about 40 1-7th old Irish gallons to the Irish acre, or 23 1/2 of the same gallon to the English acre. Immediately previous to sowing, the land should be harrowed until perfectly pulverised; after sowing, a double turn of the light grass seed harrow is sufficient to cover the seed. It should then be finished with a light roller; if the land and weather be very dry, a heavier roller may be used. If proper attention has been paid to the previous cultivation of the land for this and the preceding crops, very few weeds will likely appear; but if thistles, docks, mustard, or other weeds which can be easily pulled, do appear, they should be removed before the flax is more than four inches high, as the trampling of the weedeers on the crop always injures it to some extent, unless in its early stage of growth. The flax should be put in the steep pond immediately on being pulled—if possible, on the same day. Improperly or carelessly cultivated flax cannot be properly handled in the mill; much waste must inevitably take place, and farmers have themselves to blame if such be the case. It is necessary to caution and warn all farmers that flax should on no account be sown on land unsuited to it, either in quality, condition, or cultivation, such as poor, weedy, wet, undrained, or badly cultivated land, as, although flax is a most profitable crop, where it succeeds and is properly attended to, still there is no crop which entails so complete and so ruinous loss on the farmer if it does not succeed. The expense is considerable in every case; and a bad crop of flax returns little to the farmer's pocket, and nothing at all in the shape of manure to the farm itself.

In reply to a question from the Earl of ERNE,

Mr. WYLLIE stated that the expense of cultivating one Cunningham acre of flax was as follows:—

Two ploughings and harrowings	£1 0 0
Sowing, rolling, and weeding	0 2 6
Pulling	0 8 0
Carting to steep and placing in ponds ..	0 10 0
Taking out of steep and carting to spreading ground	0 8 0
Spreading	0 5 0
Lifting and stacking	0 5 0
Scutching and breaking	1 15 0
Carting to mills and market	0 6 6
Seed	2 0 0
Making a total of	£7 0 0

He further stated that the general produce of a Cunningham acre of flax, if the quality was fine, and yielded say 5 cwt., at £4 would be £20; medium quality of same weight, £17 10s.; and a coarse quality, £15. Flax of superior quality might go above these figures, both in yield and price, and flax might give less yield and price.—*Irish Farmers' Gazette.*

PRACTICE WITH SCIENCE.

This golden maxim, chosen by the Royal Agricultural Society for its motto, is obviously becoming "a hackneyed phrase." It is being applied to purposes for which it was never intended, and used in a sense as foreign from its true meaning as the poles are wide asunder. Like the "wisard's spell," it just means anything or everything, or nothing at all, according as the wind blows. *The brilliancy of its lustre ought not thus to be tarnished.*

Were the mariner's compass to get wrong when at sea, and were there only one instrument on board ship, better throwing it overboard at once, and be guided by the stars of heaven during the remainder of the voyage, than trust to the erroneous indication of the needle. So it has been said by an undoubted

nautical authority; and the maxim applies equally well to the Royal Agricultural Society of England and its somewhat sounding watchword; for, unless used by its members in accordance with their function as a body, in terms of their charter, the sooner it is tossed to the winds the better.

Of course this latter conclusion is out of the question. What then is to be done? There is only one way left of determining the matter, viz., to declare the motto sterling, and all who use it otherwise aliens to the seal of the society, and the grand object for which it was constituted.

But "what" it may be asked by some tyro between the stilt, "is the literal and true meaning of the motto?" When the Royal Agricultural Society of England adopts the maxim

of Practice with Science, are we to understand that the old system of farming which they wish to throw aside is practice without science? If the practice adopted to-day is practice with science, that of yesterday practice without science, what is the practice of to-morrow to be, presuming that the society is fulfilling its destiny in making progress, and that to-morrow's practice is superior to any of its predecessors? Or does the term "science" keep ahead like a shadow? And, if so, are we then right in concluding that the real meaning of the motto is akin to the old nursery story of "Aunting your shadow?"

Every practice (to come to the solution at once) has its own science; and the science of the worst practice, so far as known, is often more interesting to the intelligent agriculturist, furnishing him with more solid information, than some of the "crack systems" of farming of the present day. It follows, therefore, that any practice, let it be good, bad, or indifferent, is practice with science; consequently, the conduct of those amateur experimentalists who are now buying themselves in teaching farmers how to farm, and whose generalising rules, deduced from commercial data, are taught as the science of their practice, and in too many instances, we fear, are received as such by not a few landowners and farmers, can only be compared to something that decency feels abashed to mention; for in many cases they know little professionally about their practices, and still less each about the science of his own farming.

This perhaps may, at first sight, be considered a somewhat sweeping and uncharitable conclusion; but when the facts of the case are fairly brought into the light of day, it will be found otherwise. Is it not, for example, a notorious fact that many of these experimentalists are not eye-witnesses to the practice they report as performed by themselves? And on the other hand, is it not equally an acknowledged fact that very little is yet known of the science of any farm practice? Such being the facts of the case, and the position of the practice of the amateur teacher, and of the science of that practice—a science not applicable to any other farmer's practice—we shall leave the reader to fill up the hiatus thus left, and pronounce the award due to their conduct as he himself may see fit to conclude.

It is not to be inferred from the above that we are opposed to the performance of experiments by amateur farmers, or any body else. We have long advocated the contrary, viz., to go on experimenting; and when anything approaching a discovery is made in any branch of farming, intelligent agriculturists will soon find it out, and go and examine for themselves as to what the truth of the matter is, practically speaking. What we object to, in the teaching of these experimentalists, is simply this—they neither tell us their practice nor its science; and for a good reason, we suppose—because they know comparatively nothing about either, while their objectionable method of teaching is greatly retarding the progress of discovery in both. They no doubt know that an experiment has been performed at their expense. Thus far we give them credit. But when we come to the *ipse dixit* of the practical man, and the *modus operandi* of those who actually did perform the practice, of the case upon which intelligent agriculturists are accustomed to base their evidence are wholly wanting.

This unquestionably is not in accordance with the experimental philosophy of the present day. What, for example, would be thought of any of the Professors of our Universities were they to tell their students at the commencement or close of their lecture that the experiments referred to, and of which they give an exposition, were performed elsewhere by their practical man? Would not every student in the class-room be justified in demanding that the experiments be performed in their presence, in order to determine the application of the lecture? for unless this is done they are not eye-witnesses to the truthfulness of the exposition of the practice taught. Those who thus lecture know right well how difficult it is to perform an experiment twice with exactly the same results. We had the pleasure of being a student at one of our Universities, and in each of the class-rooms where experimental philosophy was taught, the Professors pointed out diversity of results, and had sometimes a second and third time to go through the *modus operandi* before they were enabled to do justice to the subject under consideration; and in all cases they pointed out where scientific truth was only approximated, and the necessity for further discovery before the whole was known. This was more especially the case in all those

sciences that bear upon agriculture—such as animal and vegetable physiology, chemistry, &c., the progress of discovery being farther behind in those branches than in some of those connected with the other arts.

From the large number of branches of science introduced in farm practice, a scientific exposition of it is surrounded with much difficulty. If the farmer is behind in the general march of improvement, there is obviously therefore a very cogent reason for it; for the several branches of science comprised in his profession, when examined individually, will be found not far behind the same branches in the other arts, to which they also respectively belong. Thus in vegetable and animal chemistry the agriculturist has himself to blame if he does not profit by every advance made in these two branches. The same thing may be said of animal and vegetable physiology. In this manner we might go over all the different branches of physical science involved in agriculture, without finding any material differences that call for a special notice.

The error, therefore, referred to in a previous paragraph, lies in the application of the several branches of science involved; and the manner this is done by our amateur experimental teachers, and also by too many practical men, is about as clever and amusing as can well be imagined, for they convert all the sciences into pounds, shillings, and pence, and from general expenses on the one hand, and profits on the other, deduce their so-called scientific conclusions, or Practice with Science, accordingly! Even in those cases where a very imperfect chemical analysis has been performed on the grouping system, the proximate principles thus found are treated commercially, and not in accordance with physical science, which such proximate principles are intended to represent.

Those of our readers experimentally acquainted with the prosecution of any branch of physical science will readily perceive the absurdity of the above system, and the manner it is just now practically and scientifically retarding the wheel of progress in agriculture. This is more especially felt to be the case in animal and vegetable physiology and their kindred branches of science, viz., the supplying of plants and animals with proper food, so as to preserve their normal health and usefulness; for live stock are, to speak in the mildest and most general terms, in a very abnormal state of health, not only on the continent of Europe, but also in this country, being liable to, and in point of fact very largely affected by, certain diseases, arising principally from improper food and management, while the public is also suffering heavily from the large amount of diseased meat that is thus, of necessity as it were, consumed. The public health suffers from unwholesome food, and so does the health of our cattle. The conclusion in both cases is patent, without having recourse to any detailed logical process of proof. Now such being the facts of the case, what are we as a body of intelligent farmers doing, practically and scientifically, to avert the crying calamities thus experienced, and every day increasing in magnitude? The answer to this may be given in a few words; for we are just now buying ourselves in taking the mote out of the eye of the continental farmer, whom we are teaching to frear unhealthy cattle, but have not yet begun in earnest to think of first taking the beam out of our own eye!

Very great caution is always necessary in advocating progress, from a purely pecuniary point of view, or even the general success of any established practice, whatever it may be. This will appear manifest from the facts of the case involved in the last paragraph, for the general conclusion at the present, as to profits in this country, and also on the continents of Europe and North America, derived from live stock, is obviously not in favour of the practice now pursued. And if this is the general pecuniary conclusion relative to the national balance-sheet in each case, it consequently follows that the individual examples of farm practice which return a favourable balance-sheet should be closely examined, in order to ascertain if the balance in cash is represented in practice by real value, physically speaking; for unless profits on the one hand are thus represented by intrinsic value, on the other the practice which they represent cannot be taken as a safe rule for general guidance.

Under the present system of experimental investigation little or nothing is being done to test the truthfulness of the reported pecuniary and intrinsic values of agricultural products either animal or vegetable. If the money can be made, and an abstract of the balance-sheet shown, the argument is considered conclusive. It is, in other words, the so-called Practice

with Science. It is, in short, down weight and hard cash—a tangible rule that all can safely follow! But when the practice and its returns are examined as they ought to be, they are wanting in many respects, for the vegetable produce and the cattle are both in an abnormal state of health, and hence intrinsically of an inferior quality, while their commercial value in money depends as much upon the name of the producer and the appearance of his produce as upon its intrinsic worth when sent to market.

This part of the subject would require to be examined in detail, in order to do it justice, which is far more than our present space will permit. In other words, a detailed exposition of the several practices involved would, no doubt, be necessary, to render the facts of the case intelligible to those of our readers not experimentally versant with them, which is far beyond the limits of a single paper on the subject. All that we can give at present is a very general refutation of the objectionable practice of estimating the intrinsic value of produce by its weight, and its money value by its appearance; and this is equally true of vegetable produce as of animal.

When we examine heavy weights, either in the animal or vegetable kingdom, we find an extra per-centage of water and crude matter imperfectly elaborated or not changed at all. Obees beef, mutton, and pork are examples of this kind, which have long been known to return the greatest weights of carcass from a given weight of food consumed. The extra weight of coarse watery mutton obtained from sheep fed on water meadows was well known by Bakewell, who followed the practice. "Lamh and get fat" is a common proverb; but under the obese system "cattle sleep and get fat," hence the abnormal

state of the alimentary, excretory, and other processes, and the inferior quality of meat produced. If sold in time, according to Bakewell's maxim, it has a passing and saleable appearance to superficial judges; but when stock are forced on too long, the meat actually begins to lose colour and decomposes before the animals are slaughtered. Poisonous compounds are thus formed within, while the system is subject to or attracts all sorts of contagious matter from without—matter with which the atmosphere is continually loaded, &c. In the vegetable kingdom the case is even worse, if possible, although perhaps not directly so dangerous to the health of man and cattle, more especially the latter, as they, guided by smell and taste, are led instinctively to shun grasses and other plants grown in the shade, whose juices have not been properly elaborated, and whose forage is consequently full of crude noxious matter. Now Practice with Science imperatively demands that in repeating experiments performed for the purpose of investigating physical truth, the noxious and poisonous matter contained in such heavy weights should be plainly expressed, both in the case of forage plants and in that of the carcasses of animals for the shambles. In the present state of our knowledge we cannot, perhaps, tell what the crude matter would have been converted into, had it been elaborated in the leaves of plants under a sufficiency of sunshine, heat, pure air, and light—whether it would have been converted into those odorous and sapid properties that give intrinsic value to forage plants whose juices have been properly elaborated. But there is nothing to hinder intelligent practical farmers from pointing out such data, although some of our amateur experimentalists might not like it perhaps so well.

THE INFLUENCE OF SEASON ON THE PRODUCE OF WHEAT.

It is proverbial that the weather exerts a very powerful influence on the produce of our fields. The accounts of the condition of the crops about the time of harvest, which are collected with much care by some of the agricultural papers, give, under the terms "average," "above average," "below average," "good," "bad," &c., the opinions of individuals as to the probable yield of the most important crops in many different localities. In other words, they sum up, in general terms, the probable effects of the weather of the particular season on the quantity and quality of its produce. But they at the same time necessarily take into account a great many influences besides those of the weather alone. Indeed, even were it possible to reduce these general terms to figures, and it were attempted to state numerically the proportion which the produce of one season bears to that of another, or to the average of any number of seasons, the figures would not show the comparative effects of the seasons alone, unless the crops reported on were grown under otherwise the same conditions year after year in the same locality. It would be necessary to this end that the character of the land should be the same; and that the tillage operations, the previous course of cropping, and the manuring, should also have been very nearly the same each year. But we know that these conditions do not remain the same.

In a field at Rothamsted in which wheat has been grown on some plots without manure, and on others with different descriptions of manure, for twenty successive years, the tillage operations having been, as far as the season would allow, the same year after year, the essential conditions for comparing the productive characters of one season with that of another are perhaps better fulfilled than in the case of most records of ordinary farm practice. Unfortunately, none of the plots have been dressed with exactly the same description and quantity of manure every year since the commencement, excepting the one with farm-yard dung; and owing to the great accumulation of almost every important constituent that must take place within the soil when a large quantity of this manure is annually employed, it is obvious that the difference in the amount of produce yielded by it year after year cannot be taken as simply due to the comparative effects of the different seasons. Many of the plots have, however, been supplied with artificial mineral manures alone, or with mineral manures and ammonia salts together, without any

material change either in the description or the amount employed, for the last twelve or fifteen years; and as there is sufficient evidence that the influence of these manures upon the crop of the succeeding year is comparatively limited, I propose to compare the produce and increase obtained by the application of some of these artificial mixtures in the remarkable season of 1863, with the average result yielded by the same manures over the last twelve years.

Many years ago, in a paper published in the Journal of the Royal Agricultural Society of England, it was stated, as the result of the experiments now under consideration, so far as they had then proceeded, that the farmer might assume, for practical purposes, that he would, on the average of seasons, get one bushel of increased produce of wheat, with its proportion of straw, for every 5lbs. of ammonia applied as manure for the crop, provided the soil were not deficient in the necessary mineral constituents. This statement met with much ridicule from Baron Liebig, who said that it was "a mere stroke of fancy." Whether the statement in question or this condemnation of it partakes most of "a mere stroke of fancy" may be judged by the following record of facts relating to it.

On one of the experimental plots a complex mineral manure has been applied every year for the last twelve years; and on another the same mineral manure, with an amount of ammonia salts containing 50lbs. of ammonia, has been annually applied. The average annual produce of wheat over the last twelve years has been:

	Bushels.
With mineral manure and 50lbs. of ammonia ..	28½
With mineral manure alone	18½
	—
Increase by the use of 50lbs. of ammonia..	10

Taking the average of twelve years, therefore, we have in this experiment an increase of exactly 1 bushel of wheat, with its proportion of straw, for every 5lbs. of ammonia. I propose, then, to consider this as the yield in a season of average productiveness; and, adopting this standard, to consider a season good or bad in proportion as it gave more or less increase than 1 bushel of wheat and its proportion of straw for every 5lbs. of ammonia used as manure.

In 1863 the same mixture of mineral manure and ammonia

salts gave a produce of 39½ bushels, or an increase of 21 bushels over the average produce with the mineral manure alone. In this experiment, therefore, 5lbs. of ammonia has given, in the season of 1863, an increase of more than 2 bushels of wheat and its equivalent of straw, or more than 100 per cent. above the average effect.

On another plot, with the same mineral manure, but with the large amount of 100lbs. of ammonia annually applied, the average result over twelve years was as follows :

	Bushels.
With mineral manure and 100lbs. of ammonia ..	56½
With mineral manure alone	18½
<hr/>	
Increase by the use of 100lbs. of ammonia ..	18

There is, then, even with this comparatively heavy dressing an average of nine-tenths of a bushel of increase of wheat, and its proportion of straw, for every 5lbs. of ammonia employed in the manure. In 1863 this plot gave 53½ bushels, or an increase of 35 bushels over the average produce with the mineral manure alone; that is again very nearly 100 per cent. over the average result.

On another plot, where, in addition to the mineral manure, a still larger amount of ammonia was annually employed, the produce amounted in 1863 to nearly 1 ton 15 cwts. of grain, and more than 3 tons of straw per acre. Large as this produce is, it would doubtless have been larger, had not the heavy storms of June laid the crops completely flat, in which condition it remained up to the time of harvest.

Throughout the twenty years of the experiments no season has yielded a crop at all equal to that of 1863. In 1847, 1857, and especially in 1854, the produce was very large, and in both 1854 and 1857 that obtained by the mineral manure alone even exceeded that by the same manure in 1863; but, owing to some peculiar meteorological influences in 1863 (which deserves a careful study), the increase of crop was, in

every instance where ammonia salt or nitrate of soda was employed, very much greater in that year than under like conditions in any preceding season. It was about 100 per cent. over the average of the last twelve years, and in many cases about 400 per cent. over that of the worst of those twelve seasons. In fact, the results of the whole set of experiments are perfectly consistent with those of the individual cases that have been quoted in showing the extraordinary productiveness of 1863, compared with that of any of the other years under consideration, whenever ammonia, or nitrogen in some other available form, was liberally supplied in the manure.

There is no doubt that the wheat crop of 1863 has been pretty generally a large one. But it would be fallacious to conclude from the results above referred to, that it has been over any very extensive area so much above the average as in the case of the experiments quoted. The season might possibly be too dry for wheat growing on many of the lighter descriptions of soil. And as the experimental plots manured with the mineral manure without ammonia gave a less crop in 1863 than in either 1854 or 1857, it may, perhaps, be judged that the past season would not be unusually favourable for the crop on lands deficiently supplied with nitrogenous manure.

At any rate, the effect of ammonia on the crop was, at Rothamsted, much greater in 1863 than in any preceding year of the experiments; and the fact that by its use the crop was increased from 18½ bushels (the average produce by the mineral manure alone) to 56½ bushels in the twentieth year of the growth of wheat on the same land, is surely a very significant one, and well worthy the careful consideration of those who maintain that the atmosphere is a sufficient source of ammonia (or nitrogen in some other available form) for cultivated crops, and that it is of little value or importance as a constituent of manures. J. B. LAWES.

Rothamsted.

ENGLISH FARMING.

SIR,—The present condition and future prospects of the English farmer are questions of such vast importance, not only to the large class to which he belongs, *but to the whole country*, that I venture to address to you a few remarks, in the hope that they may tend to produce a clearer comprehension of the bearings of what has been, and may be, said in connection with them. I have no wish to trouble you with statistics, or it would be easy to prove that at the present price of wheat no farmer can, under the ordinary system of cultivation, get a living profit, still less secure a fortune, and the whole question of his future turns on the probabilities of future prices. If the price of wheat at present is only an unnatural depression, and if it is likely to rise to a *considerable* extent, we have nothing to do but wait as best we may for better times; but if the present represents an approximation to the average we may expect under free trade, it becomes us to consider whether any, and what, changes of system can be adopted to meet it.

Knowing, as we do, the cost at which wheat can be grown in other countries, the constantly-increasing breadth of land in those countries likely to be brought into cultivation, and the facilities now afforded for almost instantaneous information and rapid transit, there appears to be little probability of any but low prices for wheat *in times of peace*; nor do the practical results since the adoption of free trade contradict this anticipation, the only exceptions being in those years affected by the Russian war. I cannot but conclude, then, that the price of English wheat in times of peace will range tolerably uniform, and *uniformly low*; and thus the compensation, to which farmers were accustomed to look in *bad yielding* years, is completely destroyed.

I dwell thus on wheat, because to that crop farmers

have looked as the grand reservoirs from which to draw for their heavier payments; and it is easy to see how much depends on the price of that article. For example, on a great many farms it is customary to grow about 100 acres of wheat. Suppose the price averages four quarters per acre, then, whether the price is 36s. or 76s. per qr. will make a difference of £800 *in the produce of the wheat crop of a single year*.

But we are told, if the price is likely to range remuneratively low, we ought to abandon its cultivation and to change our system. Sir, it is easy to talk of a change of system; but practical men know how much easier it is to talk than to accomplish. A change of system must be the work of many years, and it is as useless as it is rash and injudicious to talk of converting England into a vast pasture ground. Even grass will not last stock in the winter; and turnip, swedes, and wurz imply rotations, and rotations imply the growth of corn. But, even if it were possible; if the advice were to a great extent followed; and if then we were involved in war, which even now is far from improbable, and *which then would be indeed far more probable*, what would be the consequence? Why, that wheat, which under such circumstances and under the present system would perhaps be doubled in value, would then be trebled and quadrupled in price on account of the diminished area under the plough.

Is it not easy to foresee the injurious effects of so injudicious a course to the country? Famine prices would be the rule, distress general, and the country have only itself to thank for the disastrous consequences. It would be in vain to talk of tearing up the sward, and forcing the growth of wheat, at such a time, to supply the urgent need. The agricultural wheel moves slowly; seasons recur

but once in a year; the restrictions of leases, the absence of security, and the want of capital—all tend to impede its progress; and years before the growth of corn would be increased, to meet only in a degree the requirements of the country, the voice of starving thousands would ring in our ears, and internal riots be added to the horrors of external war.

Instead, then, of endeavouring to bring about a change of system so radical and so suicidal, it should be our aim, and the aim of the Legislature, to develop to the utmost the capabilities of our wet land in the growth of corn as well as in the production of meat; and to this end let us consider, 1st, The point to which the agriculture of England is tending, and 2ndly, The condition of the present generation of farmers.

Disregarding for the present the tenant farmer, let us briefly consider what course would be adopted by a wealthy freeholder in farming his estate. Of course the first well known requisites would be immediately adopted: he would drain all wet land, do away with useless fences, straighten crooked ones, erect substantial and suitable buildings, bring ample horse-power to bear on the soil, fill it with the best of manure, by fattening plenty of the best-bred beasts, sheep, and pigs with abundance of oilcake and corn. Next he would exhibit his big roots and superlative stock; and then, if wheat was selling at 40s. per quarter, and he valued his peace of mind, he would stop. But, if he wished to embitter his latter days, he would then sit quietly down, calculate the cost, and *make out his balance-sheet*.

This, sir, is no imaginary case; many brave spirits in our country have fought the battle, and gained the glory; but few indeed are brave enough to count, or at all events to publish, the cost of the conquest. They deserve all credit, and our best thanks; and they, above all others, are most competent to say whether they prefer to pocket yearly the surplus (?) of their balance-sheet, or to cut up their estate into farms of ordinary size, pocket half-yearly the ordinary rent, and wish their tenants "God speed."

And if this be the case with men of ample means and no restriction, what shall be said for the tenant hampered with vexatious restrictions, destitute of security, and under a landlord unable or unwilling to afford him the advantage of good drainage, good buildings, and open fields?

The pressure arising from competition, the discoveries of chemical science, the physical requisites for efficient cultivation, and the mechanical appliances, most especially that greatest of all agricultural mechanical appliances—the steam-plough—point onward to the absorption of small holdings and small estates in vast estates, or vast tracts under one management, be it that of individual capitalists, or, as it must one day be, of agricultural companies, provided with ample capital, and limited by no restrictions.

And now, sir, let us turn for a moment to the condition of the present race of farmers. The smock-frock farmer has long been doomed, and is almost annihilated; the small farmer is either rotten or "losing;" the moderate farmer is struggling hard, with the water up to his lips; and the large farmer is dipping into his capital to supply the cravings of his insatiable acres. And is it to such men you would turn, and tell them in mockery to farm better, to change their system, and double their capital? The condition of the present race of farmers is no light matter for the country to face; but it is one which the country is bound to, and must face. That an individual should be willing to sacrifice himself for the welfare of a community is possible and praiseworthy, but that one of the largest classes in the country should sacrifice itself for the temporary aggrandizement of the rest is as absurd as it is dangerous.

To what is the present condition of the farmer due?

I answer, primarily and mainly to the national act of withdrawing protection; and, secondarily, to the want of co-operation on the part of the landlords—though, while speaking thus generally, I may be allowed to add, that were all landlords as liberally inclined as my own, there would be nothing to say on the latter point. By the national act, the price of wheat has been brought ruinously low; and while the landlords neglect, as a body, to co-operate with their tenants, it is useless to preach to them of high cultivation and reckless expenditure. The landlords must first do their part in building, draining, laying open fields, and granting long and just leases to *carefully-selected tenants*; and then the tenants would be more inclined to do theirs.

The good arable land of this country requires a capital of from £10 to £12 per acre, if managed well. But if the farmer is to watch the markets, he must be prepared to hold back his corn occasionally and keep a reserve to enable him to make his stock purchases at the best times. He ought to have stock of the best quality, and above the average in number; he must give them artificial food beyond what is usually given; and he must purchase the best implements—all which, being interpreted, means that he ought to have a good round sum in addition, as a floating balance. Again, as the results of the best farming depend on the seasons, he must, after having sunk his extra capital, take his chance of a bad season or two; by which I mean a *real free trader, bad yield, bad quality, and bad price*; so that we are led to the conclusion that the right way for a man to manage a farm of ordinary size is to have about £15 per acre always invested in his business, and an extra £1,000 comfortably lodged in some easily accessible investment. Contrast this with the common £8 per acre in the business and nothing out, and we shall be at no loss to foretell the result of present prices; nor need we wonder if the two essentials of improvement in productiveness—cleanliness and condition—are neglected, if the condition is "whipped out" for present wants, and couch allowed to take its chance, to the deterioration of the land for years, and the injury of the country. Farmers are but mortal; they, like other men, get married, and have children; and their children, like the children of gentlemen and tradesmen, must have food, even if the couch does grow and the country does sustain damage.

Many men enter on farming as a business on the faith of protection. When protection was taken from them, they were assured that their wheat would average 56s. per qr., yet at the present time they are selling much at 40s. per qr., and called grumblers when they complain. The country has not kept its faith with the farming community; and that community has a right to some protection, be it in the shape of a moderate protective duty, or any other which can be suggested in lieu of it.

Is it said that farmers need the spur of poverty to stir them to exertion? A superfluity of the good things of this life may induce laziness, and check improvement; but I think you will agree with me that the lack of necessities does not generally tend to exhilarate or to excite the spirit of enterprise.

I have trespassed too long, I fear, on your kindness and your readers' patience; but your columns are ever the impartial defenders of the farmer's cause, and it is time that farmers as a body thought well over matters of such vital importance to them. Numerically we are strong; but I believe there is no class of any magnitude in the kingdom so weak collectively, so incapable as a body of expressing and enforcing their opinions; and this arises from our isolation, our *want of combination*. We possess the elements of strength: let us remember this, and make use of them.

I remain, Sir, your obedient servant,

W. BULSTRODE.

THE FARMER WITH NARROW MEANS.

Our modern school of political economists designate the farmer a capitalist. I once had a discussion on this point with a very intelligent man of this class, who laboured to convince me that as I was merely employing my capital in the business of farming, I was only, like every other capitalist, trying to make the most of it, and came under the same category as the fund-holder, the banker, the broker, the shipowner, the merchant, the trader, the contractor—in fact, the class of men who thus employ capital; that I was not a trader, a manufacturer, a skilled artizan, or even a workman; that I was not a professional man, *i. e.*, neither “lawyer, doctor, nor parson, nor agent, nor clerk,” &c.; in fact, I was a capitalist, and my aim and business was to turn my capital to the best account. No heed is taken, by this class of men, of the skill, judgment, knowledge, care, plodding industry, and patience brought into requisition in the management of the farm. “So there is,” say they, “in every other business.” Now, I could not fully realize all this. I called myself a cultivator, a grazier, a breeder, a grower, a gardener, a producer, and what not; yes, one of the nation’s providers, &c.; I brought forth from my farm meat (various), beef, mutton, veal, lamb, pork, poultry; I brought wheat for bread in abundance, barley for malt and meal, oats, beans, peas for meal and feeding stuffs; I brought forth potatoes, turnips, carrots, and many other vegetables for the service of man and beast, all the produce of and grown upon my farm, and, as I thought, the produce of the farm rather than my capital. And yet I am but, in truth, after all, a capitalist.

The farmer with narrow means farming as a capitalist.—It appears a misnomer, but we will take it so. How is he to make the most of it? The great cry in the present day is, that farmers do not employ half so much capital as they might profitably do, in the management of their farms. There is some truth in this remark, but let us begin at the beginning. We say then, that farmers are not so much to blame as they appear to be: it is, as every one knows, a most difficult thing to meet with a suitable farm, and matters generally turn out after this fashion: A young farmer wants a farm, he applies to numerous land-agents to aid him; he watches every advertisement to find one to his mind—for this he may wait for years; he hears of one, makes application, and if the agent finds out that he is likely to make a good tenant, he is invited to view it; it is too large for his means, but it is too good a thing to be lost; he must take it, trusting to the aid of friends and his banker. Now, I cannot attach much blame to the young man for adopting this course, and it is only one instance out of thousands; he must occupy it or none; he does so, and then comes the capitalist question. Now comes the struggle. His friends tell him he has over-burdened himself, and are very chary with their help; his bankers wish him every success, but the risk is great, and it is not in their order of business to find capital for farmers: a small temporary loan must suffice. He looks round, not knowing what to do; he must do his best according to circumstances; he therefore begins and buys the lowest-priced and inferior stock; his cart-horses and implements are inexpensive, and of course inefficient. The whole establishment upon the farm is thus placed upon a low, inferior, and unprofitable scale; but he could not do better; he hopes things will turn out well. He saves in every way: he saves in food for his stock, and for his horses; he saves in manures, in seed, and in management; he saves in his labour, and

his tradesmen’s bills &c. &c. Consequently, and in all probability, his fattening stock do not thrive: they are too poor and weak to stand their keeping: they require cake or meal. His cart-horses are too old and too weak to do their work effectually, and require better keeping than he can afford; his implements are obsolete, and ill adapted for thorough pulverization; the land must be better worked, or he must lose many crops; his green crops are defective, he cannot afford to buy artificial manures; and as his straw is converted into manure without artificial aids to stock, it is not over powerful, therefore the quality of the keeping is bad, so that the sheep, &c. consuming it do badly. This is a very common feature in many farms—niggardly management produces only meagre returns; inferior food will produce only lean animals, and not very healthy ones. This is a sorry picture of a needy farmer’s attempts to make the most of a limited capital, and for the most part such experiments fail. There are, however, some men, who can work through every obstacle. A man of this kind would concentrate his capital upon given portions of such a farm, and he would endeavour to obtain aid from others. Some would offer him agistment stock; others would hire his keeping; others would join him in a series of crops: by which means all his farm would be in highly useful occupation, so as ere long to set him free to manage all himself, the result of the application of capital either by himself or his friends. We shall not stop to discuss the question as to whether it is the application of capital as a capitalist, or whether it is the exercise of skill, energy, industry, and judgment, that makes a successful farmer; it is very evident that a farmer cannot proceed successfully without a sufficient capital, however transcendent may be his business powers.

The farmer then, although *with narrow means*, must, notwithstanding, so contrive his business management, that all shall be effectually carried out. It is to no purpose to do anything badly. Every acre must be made to produce its utmost, or he cannot be successful; for being in needy circumstances, he has many drawbacks. He cannot stock his fields advantageously, therefore he is compelled to let his keeping to the best customer, who may be a very unprofitable one, or not according to times. He is compelled to trash out his grain to meet his various payments at unfavourable seasons. He has to seek loans from friends, the interest of which soon comes round. These of themselves are great hindrances to success, and therefore make it imperative upon him to see that every part of his management is effective. The principal things he can avoid, such as expensive management, the purchase of unprofitable stock, implements, &c., the upholding of a larger establishment or household than requisite, and all unnecessary costs, personal or otherwise.—if he is a prudent man, he will look closely into these matters; and it is just possible, if all is thoroughly looked after, he may work through, and raise himself to competence and all its comforts. But it is uphill work, for the man with abundance of capital often finds enough to do to make both ends meet.

There is another view of *the farmer with narrow means* that we ought to take, both as a warning and for the purpose of showing the necessity of using the greatest care and the utmost caution and vigilance in every department of business. It is the farmer who is daily seeing these *narrow means* less and lessening, till ultimately he is compelled to succumb to the difficulties of his position.

Verily, to a kind-hearted generous farmer this is one of the most distressing of all circumstances to witness. And what farmer has not seen many such?—the worthy respectable man, who having done his best has for years borne up against his difficulties, perhaps an increasing family with his decreasing means, probably his health giving way too. His whole efforts are not able to stem his downward course; his crops are defective, prices unremunerative; his stock, from the many ills they are heir to, go wrong; losses in business by unfortunate sales. He gives up first one little comfort, then another, and another. His family render him every aid; economy to

the very utmost is practised, privations are cheerfully endured. Still all is insufficient; the debts increase, rates and bills and rents all unpaid. The crisis comes; he honestly gives up all to his creditors; the sale, the settlement; the dividend is paid; the family (hitherto happy and united) are dispersed; the children to earn their bread. The farmer and his patient partner leave their loved home for the lowly cottage and the humble fare of the indigent, with gloomy anticipations of the future. We regret to say that this is no isolated or unusual case; we trust that knowledge and prudence will cause their decrease.

BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

A meeting of the council was held at the Railway Hotel, Taunton, on Saturday, February 6th; present—Sir J. T. B. Duckworth, Bart., in the chair, Rev. T. Phillpotts, Colonel Latrell, Dr. Brent, Gillett, and Scott, Messrs. D. Adair, H. G. Andrews, G. Braginton, C. Bush, R. H. Bush, J. T. Davy, T. Danger, E. S. Drewe, Mark Farrant, J. Fry, John Gray, Jonathan Gray, H. Neville Grenville, J. Hancock, T. Hussey, M. King, J. E. Knollys, J. Lush, R. May, H. G. Moysey, G. U. Vidal, H. Williams, H. St. John Maule (secretary), Goodwin (editor), &c.

FINANCE.—Dr. Gillett, as chairman of the Finance Committee, brought up a report recommending the payment of various bills, and cheques were drawn in the usual form, the rules of the Society permitting no deviation in particular instances.

In consequence of the increase of his duties, the salary of Mr. W. Smith, of Pierrepoint-street, the Society's accountant, was ordered to be raised; and a gratuity was directed to be given to the clerks in the secretary's office, for extra duties in connection with the Exeter meeting.

SHROPSHIRE SHEEP.—A communication was read from Mr. H. Smith, of Sutton Maddock, Shifnal, complaining of certain restrictions in the prize sheet for the Bristol meeting, which would prevent his being an exhibitor of Shropshire sheep, for which there is no special class.

AGE OF CATTLE.—Mr. Fowler, secretary of the Herefordshire Agricultural Society, communicated a copy of a resolution recently passed by that body recommending that the first of January should be adopted as the date of reckoning the age of cattle for exhibition at agricultural shows. The subject was referred to the Stock Prize Committee.

DISQUALIFICATION OF EXHIBITORS.—An animal disqualified at a recent exhibition, on account of what was held to be an inaccurate representation of its age, has since been sold, and the *bona fide* purchaser now applied to the council to know if he was at liberty to enter the animal for exhibition. It was decided that, as the disqualification alluded to attached to the exhibitor and not to the animal, there was no rule to prevent the present owner exhibiting under a strictly accurate certificate as to its age, &c.

THE BRISTOL MEETING.—A report was read from Mr. J. Widdicombe, the director, explaining the steps he proposed to take for securing proper accommodation and shelter for horses at the Bristol meeting. These recommendations were ordered to be carried out, with slight modifications, which were ordered to be communicated to the director, who was unfortunately detained at home by severe indisposition. As bearing upon this subject, a letter was read from Mr. Wall, of Bristol, in which, writing from his knowledge of Durdham Down, he referred to the severity of the north-east wind even in summer, "coming as it does over the cold clay districts of Filton and Horfield," and recommending that, in laying out the yard, the sheds for horses should not face towards the north-east.

Mr. FRY said it would be well to adopt the same precaution in the case of cattle generally.

Mr. JOHN GRAY, one of the stewards, said it had come to his knowledge that an unusually large number of traction

engines and other machines, requiring large space for their display, would be present at the Bristol meeting, and he advised that great caution should be exercised in laying out the yard, so as to afford them every accommodation without interfering with the convenience of exhibitors generally.

ARTS COMMITTEE.—The report of this committee, brought up by Mr. Drewe, regretted the retirement of the curator, Mr. Gendall, of Exeter, through indisposition, and recommended the appointment of Mr. S. Hodges, secretary of the Royal Cornwall Polytechnic Society, as his successor. Reference was also made to a very ingenious design by Mr. Jonathan Gray for a second building for the arts exhibition.

The report was adopted, and ordered to be acted upon.

Mr. KNOLLYS, in highly complimentary terms, proposed a vote of thanks to the retiring curator, Mr. Gendall, accompanied by a sincere expression of sympathy with him in the causes which had led to his retirement.

The motion was seconded by the Rev. T. PHILLPOTTS, who took occasion to speak in complimentary terms of the new curator, whose services, he thought, the Society were very fortunate in securing.

Sir J. T. B. DUCKWORTH, in putting the resolution to the meeting, expressed his concurrence in what had been said by the two preceding speakers, and undertook to convey the resolution, in writing, to Mr. Gendall.

REPORTS OF COUNCIL MEETINGS.—The EDITOR reported that the proprietors of 43 newspapers in the West of England and South Wales had intimated their desire to be furnished with abstracts of the Society's proceedings, and he explained the mode in which he proposed to comply with their written requests now laid before the council.

On the understanding that no charge would be made to newspaper proprietors for such information, and that the only cost entailed on the Society would be that of printing and postage, the report was unanimously adopted, and ordered to be acted upon.

SETTLEMENT AND PUBLICATION OF PRIZE SHEETS.—Sir J. DUCKWORTH, in order to prevent a recurrence of the practical inconvenience, recently experienced, of any alterations in the recommendations of the prize sheet committee being made without due notice and deliberation, and of any publication of the prize sheet taking place before it has been finally and irrevocably settled, moved the following resolutions—the first of which is already a standing order, and only introduced as explaining the others—which was seconded by Mr. MORSEY, and carried unanimously:—

1st, That the various committees to whom the prize sheets are referred do present their reports at the October meeting of the council. That at that meeting the lists shall be gone through, and any suggestions made; but no alteration shall be finally adopted unless agreed to by the chairman or other member of the committee presenting the report.

2nd, That immediately after the said meeting, the list, with amendments (if any), be printed and sent to each member of the council in time for notice of any proposed alterations to be given in the agenda paper for the November meeting.

3rd, That the lists be finally considered at the November meeting of the council, but no alteration shall be made therein except with the consent aforesaid, unless notice of the alteration to be proposed shall have been given in the agenda paper for that meeting.

VICE-PRESIDENTS.—The names of several vice-presidents,

inadvertently omitted from recently published lists, were ordered to be supplied in any future issues.

NEW MEMBERS.—Sir J. K. Lethbridge, Bart., Sandhill Park; Professor Simonds, Royal Veterinary College, London; J. Abbott, Bideford; W. B. Wainman; John Fifield, Symondsbery, Bridport.

AGRICULTURAL EDUCATIONAL COURSE.

EXAMPLE I.

THE INCLINED PLANE AS A MODEL FOR MODERN ROAD-MAKING.

Many of the arts, more especially those connected with agriculture and landed property, have come down from the earliest times to the present day very little changed in their general character. The modern railway is an illustration of this, being identical in principle with the old *inclined plane* of Chaldea, India, Palestine, Egypt, and the far-famed "Appian Way" of the Romans. In point of fact the *inclined planes*, properly so called, that were formed for the express purpose of conveying "great stones" in the building of cities, temples, pyramids, &c., heavy goods of every kind, as at Nineveh, Babylon, Memphis, Thebes, Jerusalem, &c., were railways, rails being placed under the rollers upon which the loaded sledge trucks were borne along the line, just as we do at the present time in the removal of heavy stones from the land that cannot be carted, and which we do not want to break up by "blasting," or heavy timber out of the wood, which it is considered advisable not to cross-cut into several parts of less weight for separate handling. Those of our readers who have an opportunity of visiting, in the Assyrian gallery of the British Museum, the sculptures recently brought from the ruins of ancient cities on the Tigris, will find a very faithful illustration of this method of conveying heavy stones, the Assyrian artist having chosen for his subject the progression of a "colossal ball" upon a sledge truck as above; and to those who have not this opportunity, we may observe that this method of hauling "great stones," or "stones of rolling," as the "great stones" are translated in the margin, is alluded to by the Persian Governor Tatnai in his letter to King Darius, relative to the building of the second Temple of Jerusalem (Esra v. 8) by the Hebrews, on their return from captivity in Chaldea. To those who take an interest in sacred history, and the progress of the arts as given by the inspired writers, there is in this something very instructive, the truths which scripture records being thus corroborated by sculptures dug from the ruins of cities upwards of two thousand years after they were executed. But, however interesting this historical view of the subject may be to all who read their bibles (the fifth chapter of Esra being original y written in and translated from the Chaldea, not the Hebrew), it is not the one which we have got to prosecute, our view being the mechanical and geometrical one, and its application to modern agriculture, including the conveyance of stones, timber, and all kinds of farm produce.

We have evidently now got to a period of history when fields must be laid out purposely for steam culture; and private farm roads as well as public ones for traction engines. Such must now be considered great public questions that have been satisfactorily settled at the bar of practice, and which therefore cannot be set aside or deflected at a tangent, merely because this old wife and the next with their grandchildren shy at steam on a common road! Some things are said never to get old-fashioned, but shying at the steam-horse exercising his lungs with industrious fidelity in the employment of his master is certainly a long way out of date.

In construction, the inclined plane is similar to that of a modern railway, road, street, or carriage-way, high grounds being excavated or tunnelled through and hollows filled up by embankments, so as to make the gradients as easy as possible, or in the language of the ancient geometers, so as to make the *intersection of the planes at as small an angle as possible*. And the lesson thus taught by the Chaldeans, Egyptians, Phœnicians, Hebrews, Greeks, and Romans, is that which farmers and their landlords should learn and carry out into

practice at the present time. And the maxim of the ancient land-surveyors, in laying out the inclined plane, was to get the inclination in one plane down to the river's or canal's edge, so as to get the principal length of the conveyance by water, heavy articles being more easily conveyed by barges in the canals and rivers than upon inclined planes. Barges thus plying, loaded with sacks of corn and bales of goods, are amongst the subjects represented by the Assyrian sculptures in the British Museum, already referred to. In ancient times, the great valley of the Tigris, Euphrates, and Nile were intersected by a set of work of canals that communicated with the large rivers and principalities, down to and up from which (canals) the inclined planes led; the whole system of conveyance being thus regularly organised throughout the entire length and breadth of the country, as modern railways are now being organised.

There are in this country very few large farms where cuttings ought not to be made, and hollows embanked with the excavated material, so as to form an inclined plane from the homestead to the fields, also from the homestead to some railway station or traction-engine depot, the public roads being formed into inclined planes for traction-engine traffic, like the Appian Way of the Romans, or the causeway of Jerusalem, that joined the Temple to the upper city. In this respect the organization of the system is similar in principle to that of ancient Chaldea and Egypt, modern railways and steam-boats jointly taking the place of the barges and other shipping of oriental times. Looking across a map of the country, the proposition appears of colossal magnitude; but, like all other great projects, it must proceed from a small beginning, and as this beginning has evidently been already initiated with success, the wedge is thus entered, so that what follows may as readily be anticipated by the reader as expressed by the writer.

Will it pay? It may be as well to answer this question before going farther. Will capital invested in the formation of inclined planes or tramways for traction-engine traffic leading from farms, quarries, coal-mines, &c., to railway stations, shipping ports, &c., return sufficiently remunerating interest to justify the general organization of such a project? To this an affirmative answer may be given without a moment's hesitation, for the advantages from a mechanical point of view are so preponderatingly in its favour as to leave no alternative course. So long as we have horses we may continue to whip on as we have hitherto done without any mercy, or any regard for the overwhelming waste of muscular power annually sacrificed in upholding an antiquated system. It was otherwise with the Chaldeans and Egyptians, for their sledge trucks were hauled upon their inclined planes by captives or the lowest caste of the labouring classes; so that common sense, with a higher knowledge, perhaps, of geometry than we have hitherto generally possessed, to say nothing of humanity, had naturally suggested to them the economy of muscular power that would be effected by the formation of an inclined plane; hence they at once set about a survey and the laying out of the line. In a somewhat similar manner, now that we are becoming more familiar, perhaps, with applied mathematics, in a few instances, than our immediate forefathers, and that we have got the steam-horse fairly harnessed and successfully at work in our fields, and are beginning to pocket the profits, as well as to pay for the extra tax and wear, in puffing and snorting up hill, we shall also soon find that inclined planes will pay us as they did the Chaldeans, Egyptians, &c.; for a penny saved in the outgrage upon the

steam-horse is twopence added to the incomings or profits on the other side of the balance-sheet. In this respect there can be no mistake about the application and truth of the old adage, "a penny saved is twopence gained." Hence the conclusion.

In the investigation of this part of our subject, there is a wide difference between horse-power and steam-power that requires notice. Thus a team of horses will take a heavy pull up a short incline, and recover their wind, nerves, and muscles as soon as they get to the top and begin to go down-hill. In the days of the old stage-coach, drivers used to take advantage of this in such a manner that the horses on level stages often suffered less tear-and-wear than those on a hilly one or a long gentle incline, because it killed them both ways, up and down. The reverse of this is the case with the steam-horse; for the short, steep inclines will kill him alike going down as going up; whereas the dead level and the long, gentle incline are just what suits his wind and iron sinews, and in which he will show his mettle to his employer's advantage in the highest degree.

The arguments in the two preceding paragraphs are tangible ones in favour of forming our roads on the principle of the inclined plane of the ancient geometers, as they are in the highest degree adapted for economical traction-engine traffic. They would prove no less advantageous for horse-work of every kind now performed upon common roads, while in many cases which we could mention they would enable landowners to open quarries, and supply their own estates with stones for building houses and fences, which at present they cannot do. Inclined planes to shipping ports would also enable them to send the produce of their quarries to distant markets on equally advantageous terms to buyer and seller. Thus a traction engine that is able to haul up an incline to the quarry fifty empty trucks, could take down to the river's edge or shipping-place 100 tons of stone, &c., at a time. In a case so self-evident, we need not go into details. It was this easy descent of the loaded sledge-trucks upon the rollers of the inclined plane that enabled the Chaldeans and Egyptians to convey the heavy stones which they did, and to build the immense cities and monuments, the ruins of which astonish the present age. In those cases where the stones were quarried at no great distance from the building, they were broken down to a size fit for being carried on carts, waggons, the backs of horses, and even on the backs of slaves or those taken captive in times of war. But the large stones termed "stones of rolling" (in Ezra) were always carried upon sledge-trucks and rollers moving upon rails, both in Chaldea, Egypt, Palestine, &c.; and, as Mr. Layard in his works on Nineveh and Babylon justly observes, the practice has come down to the present day; for the very method sculptured by the Assyrian artist, in Sennacherib's time, was that by which the great colossal bulls were removed from the ruins of Nineveh to the river's edge for shipment, and placed in the position they now occupy in the British Museum.

In its simplest form, the wheeling of barrows upon planks laid end to end, up or down inclines, is perhaps the most familiar example. The "causeways of stone tracts," the "wheel-track system" of the ancients, as it has been termed in some works, the wooden tramways of our forefathers for carts and waggons, are similar in principle to the iron rails of the present day. The substitution of iron for wood and stone does not involve the discovery of a new method of economising motive power in consequence, but only an improvement upon the old plan, principally for the carriage of light goods at a greater velocity. But were we called upon to remove "stones of rolling" of the weight of some in Egypt, or of those used in the building of Solomon's Temple, we should still have to adopt the inclined plane, as they would soon crush our modern railways to dust. And we may further observe, that it was not the substitution of iron rails for wooden and stone ones, that procured for the modern inclined plane the more popular but less scientific name of "railway;" but the general organisation of the system, for iron rails were in use long before this plebeian appellation was admitted into our philosophy at any of our Universities. And we may further observe, under this, that when the Roman railways were paved with very hard stones, they were technically termed *via ferrata*, which may be translated "iron-ways."

The ancient Romans attained to great perfection in the formation of paved ways of this kind. They not only selected the most durable stone to resist the tear and wear of the

wheels; but they were also acquainted with making roads of concrete, of a quality which, if not equal, is said to be little inferior to the hardest stone. Of the Roman military roads in this country nothing requires to be said. The great roads of China also prove that the nations of the East were familiar, at a very early period of history, with the economy of motive-power in the conveyance of goods.

In all these examples the gentle inclined plane, for the conveyance of the "great stones" or "stones of rolling," is that which affords most profitable instruction for traction engine work. At present the term "inclined plane" is chiefly or rather almost exclusively confined to steep inclines, or the intersection of planes at a considerable angle, down which it would have been dangerous to have taken the large stones or rollers, such as those used in the foundation of Solomon's Temple and house already quoted, which were blocks of polished stone of the size of a haystack. They are said by the sacred historian to be "costly stones, even great stones, stones of ten cubits, and stones of eight cubits." One authority (we quote from notes taken from Josephus) says they were "20 cubits long by 10 broad and 5 high," or in feet 36 by 18 by 9.* When the declivity was considerable, rollers were dispensed with, the rails under the trucks being then greased, as we do in launching ships, &c. If the reader will turn to the sacred text, a moment's reflection will satisfy to show that the ENGINEER appointed by Solomon to plan and superintend the removal of such stones knew something about the application and economy of motive-power upon railways.

We by no means wish to undervalue the progress of Engineering Science in modern times; but in giving our own days full credit for all that is due to them, let us at the same time extend equal-handed justice to the past; and, if we do so, we shall find that in Solomon's time Palestine occupied a very prominent place amongst Oriental States; that Jerusalem was visited by the "WISE MEN" or philosophers of other nations, whose practice at that time was to travel in search of learning; and that agricultural engineers may yet derive much information from the same source.

FACTS ABOUT MILK.

1. That most milk was produced by 5½ lbs. of rape-cake, 35 lbs. of mangolds, and 25 lbs. of oat-straw.
2. That a reduction of 9-10 lb. of rape-cake in the daily food per cow diminished a good deal the milk of the superior cows. The eight cows in the third period yielded 4'4 litres less milk per day, 0'55 litre per cow. According to these results 1 lb. of rape-cake produced on an average 1 1-5th lb. of milk.
3. In the sixth series of experiments, the cows received 6 lbs. less brewers' grains per head than in the fifth series. This diminished the produce in milk to the extent of 0'72 litre. It thus appears that 1 lb. of brewers' grains produced about ½ lb. of milk.
4. In the first and third series of experiments very nearly the same amount of milk was produced. In both sets of experiments the same quantity of mangold-wurzel and oat-straw was given, and the 18 lbs. of brewers' grains given in the first series were replaced in the third by 4½ lbs. of rape-cake. Accordingly 1 lb. of rape-cake was equivalent to 4 lbs. of grains in its power of producing milk.
5. Rape-cake produced milk richer in butter than that obtained from cows fed upon brewers' grains. The butter in the latter case, however, was more delicate in flavour.
6. The modifications in the daily rations of food had far less influence on the yield of milk from the inferior than from the superior cows. Whereas the latter produced decidedly more

* The note in extenso is as follows:—"The towers were constructed of white marble, in blocks of 40 cubits long, 10 wide, and 5 deep; so exactly joined together that each tower appeared to be one mass of rock." About 18 cubic feet of marble are usually reckoned to weigh a ton. In Egypt much heavier stones than the above in Solomon's Temple were conveyed upon inclined planes.

or less milk according to the food upon which they were kept, the yield of the inferior cows was pretty constant.

7. From the 1st of March to the 5th of April the four superior cows gained in live-weight 100 lbs., and yielded 1558·9 litres of milk; the four inferior cows gained in live-weight 304 lbs., and yielded 1032·7 litres of milk. Thus in the course of 36 days the superior cows produced 526·2 litre,

more milk, and 204 less live-weight than the inferior cow. 2½ litres or about 5½ lbs. of milk consequently were replaced by 1 lb. of flesh.

As a general rule, small races, or small individuals of the larger races, give the richest milk from the same kind of food.—*Dr. Voelcker, in Bath and West of England Society's Journal.*

AGRICULTURAL LAW REPORTS

What appears to have been a singularly amusing case was heard in the Court of Queen's Bench on Thursday, Feb. 4, turning on an action of ejectment by the Duke of Marlborough against Mr. George Osborn, one of his tenants at Handborough in Oxfordshire. The dispute arose as to the proper interpretation of the following clause in the lease or agreement:—"The tenant to perform each year for the Duke of Marlborough at the rate of one day's team work with two horses and one proper person for every £50 of rent when required (except at hay or corn harvest) without being paid for the same." Upon the wording of this Mr. Osborn offered to send the horses and the man, but maintained that the Duke should find the cart; while his Grace demurred to such a reading, and contended that the means of carriage were also included in the specified terms. Of course everything was made to depend upon the actual meaning of the word *team*, and Mr. Gray for the plaintiff cited Walker's and Johnson's Dictionaries, and Gray's Elegy; and Mr. Huddleston for the defendant was still more erudite in his researches, giving in authority Bosworth's Anglo-Saxon Dictionary, Richardson's Dictionary, Todd's Johnson, Shakespeare, Spenser, Dryden, and others of our English classics, the very Judges joining in with Wordsworth and quaint epigrams by anonymous authors. Altogether, it certainly sounds like a most agreeable entertainment, and none the less so as the weaker vessel did not go to the wall; but their Lordships declared, by a majority, that the tenant was not bound to do more than such service as he had offered to perform.

Still, upon consideration, it really does seem somewhat extraordinary that a nobleman of large landed possessions and one of his tenantry should come to so serious a difference about so trivial a matter as to whether a cart should be once or twice in a year tacked on to the tails of a pair of horses or not! "Send the cart with the horses, or you shall leave the farm," says the Duke of Marlborough; and "I will not send the cart, and I will not leave the farm," answers Mr. Osborn. So they straightway go to law at Oxford, where "the point is reserved"—and "a rule is obtained"—and then "the rule was absolute to enter a nonsuit"—but, as it is an ejectment, "the plaintiff can bring another action"—and so forth. It would be a nice calculation to ascertain how many carts the two parties might have purchased with the money already laid out in law.

But there are wheels within wheels, and the definition case of the Duke of Marlborough *versus* Osborn by no means begins with the order to cart coal for Blenheim on Whit-Monday, of all other days in the year! It is the old old story that set the Duke and his tenant to logger-heads, and but for this it is more than probable that the one would never have asked for team service, or the other never have refused it. So far back as June, 1858, Mr. Osborn, holding under an agreement for a lease of fourteen years, with permission to kill the hares and rabbits on his farm by any means except the gun, writes thus to his landlord's steward: "Not one penny have I made towards this half-year's rent, in consequence of being overrun with pheasants and rabbits. Last year I had, on highly-cultivated land

contiguous to Pinsley Wood, fifteen acres of wheat, which, through swarms of rabbits, was analogous to a fallow-field, and from the sale of which I realized no more than £11. On my barley last year, before and after it was mown, between 200 and 300 pheasants were feeding on it, and the neighbourhood cried Shame! Rabbits, too, were creating large voids. Since then I had patiently waited for and hoped to see an alteration; instead of which, while I am writing, that c....d vermin the rabbit is eating my mangolds. Also a large number of pheasants are being reared as contiguous as possible to a splendid piece of wheat, and I dread a repetition of last year's loss."

It is only fair to say that the Duke gave his attention to this complaint, and the tenant is officially informed by His Grace's private secretary that "a full survey has been made of your farm, respecting the alleged damage done by game, and the report of the gamekeeper shows that no injury has been sustained; but if you can show this to be incorrect, and that damage has been done, then His Grace will be ready to make further enquiries into the matter." Only picture the keeper, who reared and guarded the game on the land, being called upon to arbitrate between the owner and the occupier! Mr. Osborn, so far from being satisfied with such a referee, says it seems to him to be "about as consistent as it would be to empanel a jury of ticket-of-leave men to try a man for housebreaking. Of course the gamekeeper would be particularly interested, and in some instances applauded (no matter at whose expense) for showing up a large quantity of game." And then the tenant delivers at the Palace a basket of mangolds, as injured by the rabbits, and requests the Duke personally to inspect the crop in order to arrive at a correct idea of the value of the keeper's report. After this he sends in his bill:

"1859.

"His Grace the Duke of Marlborough

"Dr. to George Osborn, Handborough.

"To Maintenance of Two Hundred Pheasants and Poultry on Wheat and Barley, for the year ending 18th September, 1859.....£10 0 0."

While he adds in comment, "Some will say, What has poultry to do with game-preserving? Broody hens are procured from farm-yards, they sit on pheasants' eggs, which are collected, and in some instances bought of men of questionable character, from 6d. to 1s. 6d. each. The hen brings up her young as tame as herself, sometimes tied by the leg, sometimes in coops, and afterwards, when sufficiently strong, they stray away into the corn-fields, where for every grain they eat ten drop on the ground, to the loss of the farmer and the human family. Drive them out you cannot, without doing damage to the standing corn." As a collateral consequence on no adjustment of the claim, the keeper and the labourers get to squabbling, when the latter endeavour to catch the rabbits, and James Weller is "had up" at the Petty Sessions on the information of Robert Mason, game-keeper, for trapping a pheasant; but the case is dismissed. This is in August,

1862; while in December Osborn puts Maisey, or Mason, as his name may be, into the County Court at Witney, for unlawfully taking up rabbit traps, when the judge "considered the plaintiff had a right to set wires or traps of a proper description, and a person then disturbing them would be liable to an action for trespass; but he thought plaintiff ought not to allow them to be set so near the wood. It was extremely difficult to define what was a proper exercise of plaintiff's right, but he hoped the observations he had made would tend to prevent any further misunderstanding; and upon his Honour's suggestion, it was agreed on both sides to withdraw the case." Of course, such a decision, or rather such a want of decision, by no means tended "to prevent any further misunderstanding," although the keeper Maisey was discharged; but the subjoined further account was not:—

"His Grace the Duke of Marlborough,
"Dr. to George Osborn.

"Sept. 16, 1859. Bill delivered	£10	0	0
"Jan. 16, 1868. To damage to my crops, in consequence of your servant, James Maisey, deliberately (in the face of notice to the contrary) taking up, destroying, and carrying away traps and wires, set to catch hares and rabbits, on my land, both before and since this date	10	0	0
	£20	0	0"

The next act, occurring some four or five years after the scene where we opened near Pinsley Wood, is the demand by the Duke's agent for coal carriage, to which Mr. Osborn rejoins in the first instance that at the execution of his lease it was agreed he should not go to cart coal, and that he had not done so since that period. However, the actual clause it appears stands against him, and on this they join in issue, as argued in Westminster.

In returning to this moving point in the matter, we would for a moment prefer to put the present parties to the action entirely out of Court, when we say that we hope never again to see any such a plea discussed. The free service by tenants to the lord is simply a remnant of a feudal age that we should long since have outlived. There may be possibly in many old forms of lease or agreement other such curious clauses, but in these days they should stand for nothing better than curiosities. Let the tenant pay the landlord a fair rent for his farm, but let him subject himself to no such vassalage, and let the other no longer require it of him. On many large estates we are glad to say that these obsolete provisions have been thoroughly revised, as, in fact, the spirit of the age will not admit of their continuance.

IMPORTANT TRIAL.—WHAT IS A TEAM?

In the Court of Queen's Bench, the following important case was tried:—

THE DUKE OF MARLBOROUGH v. OSBORN.

This was a case which raised a rather curious philological discussion with some interesting poetical illustrations. It was an action of ejectment by the Duke against a farmer, one of his tenants, at Hanborough, in Oxfordshire, to recover his farm, on the ground of an alleged forfeiture on the following clause in his agreement of tenancy:—"The tenant to perform each year for the Duke of Marlborough, at the rate of one day's team work with two horses, and one proper person, for every £50 of rent, when required (except at hay or corn harvest), without being paid for the same." The Duke's agent had desired the tenant to send a cart to carry coals from the railway station to the Duke's mansion at Blenheim. This the tenant refused to do, though he offered to send the horses and the man, contending that the Duke was to find the cart. This was the point in contention between the parties. The case was tried

at Oxford before Mr. Justice Byles, who reserved the point, the verdict being entered for the Duke subject thereto. Mr. Huddleston, Q.C., had obtained a rule on the part of the tenant to set aside the verdict and enter it for him.

Mr. GRAY, Q.C., and Mr. CRIPPS argued on the part of the Duke, in support of the verdict, and against the rule to set it aside. They contended that, according to the agreement, as the tenant was to do "team work," and it could not be done without a cart, he was bound to find the cart.

In the course of the argument of Mr. CRIPPS, Mr. Justice CROMPTON said, in the course of his reading he had met with the following lines, which seemed to show that the team was separate from the cart:—

"Giles Jolt was sleeping—in his cart he lay,
Some waggish pilferers stole his team away.
Giles wakes and cries, 'Odd's bodikins, what, what?
Why, how now, am I Giles or not?
If he, I've lost six geldings to my smart;
If not, odd's bodikins, I've found a cart.'"

(Much laughter.)

Mr. Justice BLACKBURN cited some lines from one of Wordsworth's poems—we believe from the *Waggoner*—the lines beginning thus:—

"My jolly team will work alone for me."

Mr. CRIPPS cited *Walker's Dictionary*:—"Team, a number of horses drawing the same carriage;" and so *Johnson's Dictionary*:—"A number of horses drawing the same carriage."

Mr. Justice CROMPTON said these citations seemed to imply that the team was distinct from the carriage.

Mr. CRIPPS urged that the team without the cart would be of no use, and he cited a stanza from *Grey's Elegy*:—

"Oft did the harvest to their sickle yield,
Their furrow oft the stubborn glebe hath broke;
How jocund did they drive their team afield!
How bowed the woods beneath their sturdy stroke!"

He also cited the description given by Cæsar of the mode of fighting from the chariot adopted by the ancient Britons, who used to come out of their chariots and "*percurrere per temonem*." The learned counsel also alluded to what he called the "graphic" account of the battle of Bull's Run, in which it was stated that "the teamster cut the traces of the horses."

Mr. HUDDLESTON, Q.C., and Mr. GRIFITHS argued on behalf of the farmer, in support of the rule to enter the verdict in his favour. They cited *Bosworth's Anglo-Saxon Dictionary*:—"Team: issue, offspring, progeny, a succession of children; anything following in a line."

Mr. Justice CROMPTON: Surely the word there must be spelt "team." (Laughter.)

The learned COUNSEL cited *Richardson's Dictionary*:—"Team: a team or yoke of working cattle;" adding, "Somner applies it to a litter of pigs." (Laughter.)

Mr. Justice CROMPTON: What, is the word applied to a string of little pigs? (Great laughter.)

The learned COUNSEL observed that it was even applied to a line of ducks; in fact, to a line of any sort of animals. It meant in the present instance a pair of working horses in a line—not abreast; for that would require a different kind of harness, and it could not be supposed that the man was to drive them in a cart "tandem" fashion. The team was like a team of pack-horses or horses in a waggon, only the Duke was to find the waggon or cart. Beyond all doubt, the Duke was to find the work that was to be done. Was he not to find the tackle, or machinery, or vehicle adapted to the work to be done?

Mr. Justice MELLOR: How is team work to be done without a cart?

Mr. HUDDLESTON: How is it to be done unless work is provided to be done? And if the Duke is to provide the work, why is he not to provide what it is to be done with? Otherwise the Duke may vary the work to be done infinitely, and throw on the tenant the burden of providing tackle or machinery or vehicles fit for it. Put the case of harrow work or plough work. Was the tenant to find the plough or harrow, or the coal-cart, or the dung-cart, or the waggon, or what not? Surely the Duke, as he furnished the work, must provide the proper vehicle or tackle for it! All that the tenant had to do was to perform the team work. But a team alone could do no work; and how could the tenant, before he

knew what work was to be done, provide the tackle for it? The learned counsel made the following citations:—

Johnson's Dictionary, Todd's Ed., 1827.

"Team (n. s.) (team, the team of a carriage—Latin; team, Sax., a yoke).

"1. A number of horses or oxen drawing at once the same carriage.

'Thee a ploughman all unweeting found
As he his toilsome team that way did guide,
And brought thee up in ploughman's state to bide.'

—*Spenser.*

'We fairies that do run
By the triple Hecate's team,
From the presence of the sun,
Following darkness like a dream;
Now we frolick.'

—*Shakespeare's Midsummer Night's Dream.*

'I am in love, but a team of horses shall not pluck that
from me, nor who 'tis I love.'—*Shakespeare.*

'After the declining sun
Had chang'd the shadows, and their task was done,
Home with their weary team they took their way.'

—*Roscommon.*

'He heav'd with more than human force to move
A weighty stone the labour of a team.'—*Dryden.*

'In stiff clays they may plough one acre of wheat with a
team of horse.'—*Mortimer.*

"2. Any number passing in a line.

Like a long team of snowy swans on high,
Which clap their wings, and cleave the liquid sky.'

—*Dryden.*

'To team (v. a.) (from the noun), to join together in a team.

'By this the night forth from the darksome bower
Of Erebus her teamed steeds gan call.'

Spenser (Virgil's quart.)"

After a long and interesting argument, the learned judges consulted together, and then delivered judgment.

Mr. Justice CROMPTON said he thought that the Duke, the plaintiff, had not made out his case so clearly as to sustain a forfeiture. In the modern sense of the term the word "team," to say the least, did not clearly imply the cart as well as the horses. He thought that the meaning was that the farmer was to bring the horses and do the work he was set to. Something must be added to the agreement to make sense of it. It might be said that it was not stipulated that the Duke should find the cart. But so neither was it stipulated that the farmer should do so. And then it must be considered that the Duke was to prescribe the work to be done. And the farmer could hardly bring the proper vehicle or tackle before he knew what the work was. Moreover, the agreement was not to draw the coals, but to perform the team work. If it had been to draw the coals, then the tenant would have had to find the cart.

But it was not so. The work to be done was not confined to agricultural work. The work might be to draw timber, or carry coals, or draw a plough or harrow, or what not. In all these cases the tackle or vehicle would vary. And if in all these cases the tenant was to find it, the contract would be very oppressive. He thought that it was enough if the farmer sent the horses and the driver to be put to such purpose as the Duke's agent might please. It was to be lamented that these contracts were not made more clear; but on the best construction he could put upon the agreement it did not mean that the tenant was to bring the cart.

Mr. Justice BLACKBURN concurred. No doubt it was a general legal principle that if a man contracted absolutely to do a specific thing he must do it, and find the means to do it, as in the common mercantile case of a vendor contracting to sell goods "free on board"—that is to put them on board free of charge, in which case, of course, he must find lighters for the purpose, though, on the other hand, the vendee must provide and name the ship. So here, if the contract had been to draw the coals, the farmer must have found the cart as well as the horses. But here the Duke was to define the work to be done, and it must be work proper to be done by a team of horses. It might be to break up a field, in which case the tenant might say, "Here is my team, and I am ready to do the work; but where is the plough?" So, if he were set to draw timber, he might ask for clamps and chains to draw it with; so, if he were asked to draw coals, he had a right to demand the cart, for it was impossible that the team should do all these varied kinds of work without the proper tackle and vehicle.

Mr. Justice MELLOR differed, and thought that the farmer was bound to provide the cart. It might well be that the Duke might not have the proper vehicles to do the work, for he was to do the team work, and he could not do it without the vehicle or tackle. The contract was not merely to furnish the horses and man, but to do the team work, and that bound him to do and provide all that was necessary to do the team work.

The majority of the Court being, however, in favour of the former, the rule was absolute to enter a nonsuit.

Mr. GRAY observing, however, that, as it was an ejectment, the Duke could bring another action anyhow.

Notice of appeal was given on the part of the plaintiff on Saturday.

WHAT IS A CART?

The St. Leonard's county magistrates decided on Saturday (present: Messrs. North, M.P., Lucas-Shadwell, Kay, Crake, and Sir A. Ashburnham) that a "cart" or "chaise" belonging to Mr. Woodhams, bailiff to Mr. Frewen, at Coghurst, was a cart, and fined Fisher, the toll-collector at Halton Gate, ld., and £1 8s. 10d. costs, for charging it as a chaise. The exemption was based on its having no dashing iron, apron, or lining, and the having to step over the fordside to get in. Mr. Woodhams admitted using it for pleasure trips.

THE MINERAL THEORY.

BY BARON LIEBIG.

SIR,—As the question of producing food more abundantly and more cheaply becomes annually increasingly pressing, owing to the limited area of our land and the almost unlimited increase of our population, I trust that you will consider the following original communication from Baron Liebig worthy of insertion in your columns. I send it by request of the Baron.

I am, sir, your obedient servant,

J. J. MEBEL.

Tytree Hall, Kelvedon, Essex, Jan. 30th, 1864.

In the last number of the *Journal of the Royal Agricultural Society of England*, there is a paper by Messrs. Lawes and Gilbert, in which old charges against me, personal and others, are revived; and as they have sent an extract from that paper to all the Universities, Agricultural Colleges, and Journals in

Germany, as well as duplicates to myself, it is evident that they attach a great value to their statements, and in order to give others the means of judging them correctly, I think it advisable to answer them.

In my *Principles of Agricultural Chemistry* (p. 90, 1855), I had called Messrs. Lawes and Gilbert's attention to the fact: that their experiments included the proof that farmyard manure (organic manure) could be entirely replaced by mineral manure (for sulphate of ammonia and sal ammoniac are mineral); and, therefore, so far from refuting my doctrine, they had really substantiated it. To this they replied that *ammoniacal salts belonged to the class of organic manure*; that I had always considered them as such; and that in falling back on the strictly scientific meaning of the terms *mineral* and *inorganic*, I was begging the question; was trying by a

manure or ruse to give a new definition to my mineral theory, or rather to substitute for it another which was not my own. Although I tried to convince them by a paper printed in the *Journal of the Royal Agricultural Society of England* (1856) that I never had considered ammoniacal salts an organic manure, they return to their accusatory now, and endeavour to support them by quoting the following passages of my works:—

"But the weight or amount of the crops is in proportion to the quantity of food of both kinds, atmospheric and mineral, which is present in the soil, or conveyed to it in the same time. By manuring with ammoniacal salts a soil rich in available mineral constituents, the crops are augmented in the same way as they would have been if we had increased the proportion of ammonia in the air."—*Principles*, pp. 77-8 (1855).

"The mineral constituents act, as is shown by the produce of the unmanured land, without any artificial supply of ammonia.

"The ammonia increases the produce only if the mineral constituents be present in the soil in due quantity, and in an available form.

"Ammonia is without effect if the mineral constituents are wanting. Consequently, the action of ammonia is limited to the acceleration of the action of the mineral constituents in a given time."—*Principles*, pp. 86-7 (1855).

"... the other is the action of sulphate of ammonia as a solvent for certain important mineral constituents of the soil."—*Id.*, p. 99 (1855).

"Ammonia, when used as a manure alone, and when there is a want of mineral constituents in the soil, is like the spirits which the labourer takes in order to increase his available labour, power, or imagination; and, like that stimulant, its action, in this case, is followed by a corresponding exhaustion."—*Id.*, p. 106 (1855).

"A fertile soil must contain in sufficient quantity, and in a form adapted for assimilation, all the inorganic materials indispensable for the growth of plants.

"A field artificially prepared for culture contains a certain amount of these ingredients, and also of ammoniacal salts and decaying vegetable matter."—Fourth Edition, p. 169.

It is scarcely necessary to multiply these citations, as the meaning of them is nearly the same.

The conclusion which is drawn by Mr. Lawes from these passages is the following:—

"These sentences will be sufficient to show whether or not Liebig is justified in now attempting to fall back, in agricultural discussions, upon the more strictly scientific meaning of the terms 'mineral' and 'inorganic,' so as to include within them 'ammonia,' 'ammoniacal salts,' 'atmospheric constituents,' &c., and thus to give a new definition to his mineral theory, or rather substitute at this date for his own theory, which has proved to be erroneous, another not his own."

It is quite true that I have contrasted ammonia with mineral substances; but the meaning of these passages must be obvious to any candid reader of my works. I said (Fourth Edition, p. 50):—

"No conclusion can have a better foundation than this—that it is the ammonia of the atmosphere which furnishes nitrogen to plants."

In my *Principles of Agricultural Chemistry*, from which the first passages quoted by Lawes are taken, I said:—

"All these substances (phosphoric, sulphuric, silicic, and the alcale, lime, magnesia, iron, &c.), are included in the term mineral food of plants. Carbonic acid and ammonia are the atmospheric food of vegetables."—(P. 24.)

In my book I had to explain the relation of the atmosphere to the soil in the growth of plants, and to distinguish the elements furnished by the air and those by the soil, and to avoid, by contrasting them, a long tedious enumeration of each of these elements, which all had been stated as inorganic, I divided them into two classes—*atmospheric* and *mineral*.

I must admit that some scientific education is required for a man to understand that the word *atmospheric*, designating gaseous compounds, like the word *salt* (for ammoniacal salts), in whatever connection they may be used, entirely exclude the idea of *organic*. We speak frequently of salts of organic acids (acids derived from organic compounds), but a salt itself is never called organic, because it is exactly the opposite of organic. As to the term *mineral constituents*, I showed in the 8th chapter of my book that the constituents of ashes are originally constituents of minerals—thus, potash a constituent

of feldspar, phosphoric acid a constituent of agratite, &c.—(See also chapter 9 on formation of arable soil, and chapter 12 on fallow.)

From this it will be understood why I used the word *mineral constituent* to designate the constituents of ashes, sometimes of soils, but never for ammonia.

Ammonia is a constituent of the atmosphere, but is never a constituent of any mineral: it is mineral and inorganic, but not a mineral constituent.

For a man not versed in scientific language there is some ambiguity in the word *mineral*—at least in Germany we say *sulphate of ammonia is mineral* (in its origin), and the mineralogists say sulphate of ammonia is not a mineral (species); but this has nothing to do with Lawes and Gilbert's accusations.

Although the word *organic* does not occur in any of the sentences quoted from my works, and is never associated with ammonia, although I distinctly stated that the opposite of *mineral constituents* was *atmospheric*, they affirm that by *atmospheric* I understood *organic constituents*. Their mode of arguing is most simple. They take any passage out of my book, twist their own erroneous idea into it, and then assert that, by contrasting ammonia with mineral constituents, I had regarded it as an organic manure.

The origin of Messrs. Lawes and Gilbert's wonderful statements can scarcely be understood without referring to a definition of manure which Mr. Lawes gave in 1847, and which he is pleased to call his theory. It is the following (*Journal of the Royal Agricultural Society of England*, vol. I., p. 240.):—

"I NOW COME TO THE ACTION OF MANURES, WHICH ARE generally divided into two classes—*organic* and *inorganic*. ALTHOUGH THIS DISTINCTION IS BY NO MEANS SATISFACTORY, I SHALL ADOPT IT AS BEING GENERALLY UNDERSTOOD. Organic manures are those which are capable of yielding to the plant, by decomposition or otherwise, ORGANIC MATTER—carbon, hydrogen, oxygen, and nitrogen—CONSTITUENTS WHICH UNCULTIVATED PLANTS DERIVE ORIGINALLY FROM THE ATMOSPHERE. Inorganic manures are those substances which contain the mineral ingredients, of which the ash of plants is found to consist."

Before I enter on any discussion of this definition or theory, I must beg to recal the views on the food of plants, which I published in the year 1840. They are contained in the following passage:—

"The elements of nourishment of all green plants are inorganic or mineral substances.

"The plant lives on carbonic acid, ammonia, water, phosphoric acid, sulphuric acid, lime, magnesia, potash, iron; and many, too, require common salt."

As I did not admit the existence of organic food, my theory was called *mineral theory*. This name was correct, inasmuch as it was directly opposite to another theory, which prevailed before 1840.

According to De Saussure, Sprengel, Thaër, &c., there were two different laws of nourishment, and two kinds of manure, *organic* and *inorganic*.

"Uncultivated plants," says De Saussure, "receive their combustible elements from the air, their carbon from carbonic acid; but the products generated from this kind of food possess no value for agricultural purposes. The normal development of cultivated plants, on the other hand, and the amount of produce of arable fields, depends on organic matter in the soil, on residues of fermentation, and decay of animal and vegetable matter."

"Fertile soils contain a mixture of these remains, and their absorption by the roots is a powerful assistance to the food which is contributed by the air and water."

"Plants receive their nitrogen almost entirely by the absorption of the soluble organic substances."

"Mineral substances, marl, gypsum, clay, lime, favour the growth of plants, but take no part in nourishment."—(See *Bibliothèque Universelle*, t. 36, p. 430; *Ann. of Chemistry*, t. 42, p. 235).

This view, it will be seen, is diametrically opposed to my theory, inasmuch as De Saussure maintained the necessity of organic food for cultivated plants, and I denied it altogether.

At first sight, the so-called theory of Lawes, or his definition of manure, would seem exactly identical with that of De Saussure. Mr. Lawes assumes the existence of different laws for cultivated and uncultivated plants, and of two classes of ma-

nure, *organic* and *inorganic*, just as De Saussure and Sprengel maintained; and most certainly Mr. Lawes does not claim this theory as his own, but states that it was generally understood, though by no means satisfactory.

There are, however, two essential differences between Mr. Lawes's so-called theory and that of De Saussure. First, that Mr. Lawes admits the existence of *inorganic food* or *manure*, consisting of the substances contained in the ashes of plants. The second, that Mr. Lawes applied the name of *organic manure* to something very different from what De Saussure meant. For the first, De Saussure knew nothing of the fact that the ashes of plants were nutritive elements; for he maintained that they (for instance, potash, lime, magnesia) were variable ingredients, changing with the geological formation and character of soils. I think no one can deny that I was the first to point out that the elements of the ashes were really food of plants, and Mr. Lawes has most certainly no claim to this essential part of my theory.

As to the second, by *organic manure* De Saussure meant genuine *organic matter*. Mr. Lawes, however, has not the slightest desire to prove that the *vegetable mould* of Sprengel, or the *organic extracts* of De Saussure, are necessary ingredients of an efficient manure. On the contrary, all his experiments tend to prove that these substances, which cannot be produced in a manufactory, are not necessary. What then does Mr. Lawes mean by *organic manures*?

The candid reader will be puzzled to learn that Mr. Lawes's theory, correctly expressed, is exactly the same which I published seven years before his definition of manure: That the action of manure depends on two classes of bodies. The combustible part of plants derive their carbon, hydrogen, nitrogen, and oxygen, from *carbonic acid*, *ammonia*, and water; the incombustible parts of plants consist of phosphoric, sulphuric acid, potash, soda, lime, magnesia, silica, iron; that "stable manure, the excrements of men and animals, do not influence vegetable life by means of their organic elements, but indirectly by means of the inorganic compounds which decomposition and slow combustion produce; in consequence therefore of their carbon being changed into carbonic acid and their nitrogen into ammonia. Thus *organic manure*, consisting of parts or remains of plants or animals, may be replaced by those inorganic compounds into which it resolves itself in the soil."

The difference between Lawes's theory and mine is simply this—that he has *borrowed the substance of mine* and the terms of De Saussure's theory—that he calls ammonia, carbonic acid, and water, which I had called *atmospheric food*, *organic manures*!

There is still a question to be solved: Were these three substances classed by Lawes as *organic manure* generally understood by that name?

Now, it is perfectly certain that neither De Saussure nor Sprengel employed the term "organic" to denote these three substances, which they knew as inorganic. This denomination can therefore not be referred to them. There exist, moreover, no chemical works published before or after Lawes's definition (1847), in which they are classed as *organic food* or *organic manure*. It was, consequently, not generally understood that ammonia, water, and carbonic acid belong to the class of *organic manure*. The part of Mr. Lawes's theory which belongs to himself is merely this erroneous nomenclature. I repeat that the terms of his definition of manure he has taken from De Saussure. The essence of it is simply mine; but the manner in which he has tacked De Saussure's terms on to my meaning is purely his. We must let him have the credit of the invention, and a monopoly of the property.

I cannot think that the humblest teacher of chemistry in Great Britain would be content to accept a theory from a man who shows such ignorance of the first elements of chemistry as Mr. Lawes; and yet Mr. Lawes has the conceit to make believe that I had adopted his definition of manure seven years before he gave it, and that, although it was by no means satisfactory to himself, it was perfectly satisfactory to a German professor of chemistry.

Mr. Lawes accuses me of a *manœuvre* and a *ruse*; and I convict him of trying, by a false definition, to annex a theory which I have the sole right to claim. It is obvious that his definition of manure would be perfectly satisfactory if his word *organic* were changed into my word *atmospheric*, and carbonic acid, ammonia, and water included in the term *inorganic*, to which they are universally assigned. Messrs. Lawes and Gilbert's conclusions belong to that class which goes under the name of *Fallacies of Confusion*, in John Stuart Mill's *System of Logic*, and which comprehends, "among others, all those which have their source in language, whether arising from the vagueness of our terms, or from casual associations with them, in which no other causes can be assigned for the mistake committed than neglect or inability to state the question properly, and to appreciate the evidence with definiteness and precision."

If the leading idea of my work is borne in mind, as it is stated in the following passage (Fourth Edition, *On Manure*, p. 188)—"A time will come when plants growing upon a field will be supplied with their appropriate manure, prepared in chemical manufactories, when a plant will receive only such substances as actually serve for its food, just as at present a few grains of quinine are given to a patient afflicted with fever, instead of the ounce of wood which he was formerly compelled to swallow in addition"—it will be seen that all my statements and endeavours were directed with a view to oppose the ruling idea that *organic manure* was necessary to preserve the fertility of fields, and to increase the crops. The prejudice in favour of their necessity had grown to be a dogma; and the progress of agriculture depended on the farmers becoming aware of their error.

My whole book may be described as an uninterrupted protest against the existence of *organic food* of plants; for *organic matter* cannot, in the nature of things, be produced by chemical manufactories; and, if they were really necessary, chemistry could afford no assistance to agriculture.

If any one will consider the real cause of this sixteen years' controversy, he will be aware that it is a false definition of manure. If Messrs. Lawes and Gilbert had not classed ammonia and ammoniacal salts among *organic manures*, a dispute upon my theory would have had no excuse. There is something so degrading, from a scientific point of view, at the bottom of this controversy, that those who have taken part against the only scientific doctrine which agriculture possesses will look back with shame when a few years have elapsed; but there is nothing humiliating to me, although much that is highly annoying, for I am not so proud as to think myself humbled when I am fulfilling the vocation to which I have devoted my life—that is, of instructing others. To suppose that in this controversy I was influenced by personal motives would simply be absurd. When I strenuously endeavoured to make the agriculturists view things rightly, it was not for their own sakes, but in order to ward-off future evils and the imminent dangers which threaten society at large. Every man of intelligence must see the strongest confirmation of my teaching in all the facts produced in this dispute. Every single experiment of Messrs. Lawes and Gilbert brings new evidence in its favour; and every doubt must disappear by the creation and progress, in all countries of Europe, of an immense branch of industry—the fabrication of artificial manures from inorganic or mineral substances, which is now extensively employed.

Mr. Lawes's definition of manure, though false in itself, may yet have had, perhaps, a good effect in diffusing more widely these artificial manures, which are all, without exception, *mineral manures*. The prejudice in favour of *organic manure* was so strong that many agriculturists accepted, under that name, artificial manure which they would have refused under the name mineral manure; and Mr. Lawes, acting on his definition, could give, in all conscience, the assurance that their manure for corn contained the *organic* constituent which is most efficacious in stable-dung.

A FEW FIGURES ABOUT THE MALT-TAX.

When a gentleman observes that he has "just a few words" to say at a public meeting, you may be sure that he is good for a column or so; and we fear that when we talk about "a few figures," we shall perhaps fall into the same self-delusion. The importance of the subject of the malt-tax at the present time is, however, so urgent, that we are induced, at the risk perhaps of boring a few readers, to enter into some rather lengthy statistical details on the question for the twenty years ending 1862 inclusive. And first, with regard to the quantity of malt charged with duty

FIRST TEN YEARS.		SECOND TEN YEARS.	
Year.	Bushels.	Year.	Bushels.
1843	35,693,890	1853	42,039,748
1844	37,187,186	1854	36,819,860
1845	36,545,990	1855	33,887,234
1846	42,097,085	1856	37,980,041
1847	35,907,815	1857	40,298,513
1848	37,545,912	1858	41,605,665
1849	38,985,460	1859	44,219,300
1850	40,744,752	1860	38,952,513
1851	40,327,412	1861	44,141,422
1852	41,072,486	1862	41,118,172

The average in the first decennial period was 38,546,799 bushels, and in the second 40,108,197 bushels, showing an increase of 1,559,398 bushels, or 4.04 per cent. Malt was made free of duty for distillery purposes and for exportation, Aug. 14, 1855; and it is curious to observe what a considerable trade has since been developed in the latter direction (the figures given include, it should be observed, the estimated quantity used in beer exported):—

MALT EXPORTED.

FIRST TEN YEARS.		SECOND TEN YEARS.	
Year.	Bushels.	Year.	Bushels.
1843	—	1853	161,962
1844	—	1854	19,655
1845	—	1855	986,926
1846	—	1856	1,313,064
1847	—	1857	1,421,992
1848	—	1858	1,549,213
1849	—	1859	1,761,439
1850	—	1860	1,707,099
1851	20,690	1861	1,284,514
1852	51,160	1862	1,499,447

Although of late—that is, in 1861 and 1862—some check appears to have been given to the exports, the stride made since 1855, when a concession was made by the Government, is so overwhelmingly marked, that it is scarcely necessary to call attention to it. But this is not all. The quantity retained for distillery purposes since 1854, free of duty, would appear to have been as follows:—

Year.	Bushels.	Year.	Bushels.
1855	514,010	1859	3,526,989
1856	3,599,063	1860	2,801,537
1857	4,246,956	1861	2,508,678
1858	3,500,108	1862	2,570,436

The actual progress made in the consumption of malt, comparing 1845 with 1862, would then stand thus:—

	1843.	1862.	Increase.
	Bushels.	Bushels.	Bushels.
Charged with duty	35,693,890	41,118,172	5,424,282
Exported.....	—	1,499,447	1,499,447
Retained for distillation.....	—	2,570,436	2,570,436
Total	35,693,890	45,188,055	9,494,165

The general augmentation in the twenty years would thus be at the rate of 26.61 per cent., a respectable although not a very brilliant progress, which may be attributed, to some extent, to accidental circumstances, as in 1846 the quantity of malt charged with duty was 42,097,085 bushels, while in 1862 it was 41,118,172 bushels. Sir Fitzroy Kelly was not

quite correct in stating that the queer little bill just introduced by Mr. Gladstone was the first measure of relief which had been accorded to the agricultural interest for thirty years, as it is clear that the measure of August 14th, 1855—which in 1862 had the effect of absorbing 4,069,883 bushels of malt as compared with the pitiful total of 51,160 bushels coming under the same category in 1852—has clearly proved a considerable boon to the agricultural interest. But, like the Little Pedlington Journalist, Sir Fitzroy was "right in the main," and the imposition of the succession duty by Mr. Gladstone in 1853, which, in consequence of the pressure for farms, will probably be eventually paid in increased rent by the tenant-farmer—may fairly be set against the boon accorded in 1855. Assuming, for the sake of argument, that each bushel of malt consumed put a profit of 1s. into the pocket of the tenant-farmer, the legislation of the last twenty years would have benefited that class to the extent of £474,708 in 1862, as compared with 1843.* When Mr. Gladstone imposed the succession duty in 1853, that able financier—able, that is, from the loan and moneyed interest point of view—calculated that the new tax would produce the exchequer a round £2,000,000 per annum; and the right hon. gentleman was not far wide of the mark. Well, the bulk of this additional succession duty is paid by the landed interest, and a large number of proprietors relieve themselves of the burden imposed upon them by tacking a little more rent on to their tenants. Even assuming that the tenant class only pays half this new import, the British farmers were mulcted by the Chancellor of the Exchequer with an additional tax of £1,000,000 in 1862-3 as compared with 1843, while they had been relieved or benefited in the same period to the extent of £474,708, leaving a balance against them of £525,292. Taking into account the increase of rents in the same period, the position of the tenant farmers would be now woful indeed, but for increased intelligence and increased production.

But we are forgetting our "few figures." Just enough has been done by various Chancellors of the Exchequer during the 20 years to show how powerfully reductions or abolitions of taxation increase consumption. Thus, the measure of Aug. 14, 1855, led to the consumption of 4,069,883 more bushels of malt in the matter of export and distillation than in 1852; and so far so good. But in 1854, the Government, hard pressed as it was by the exigencies of the Crimean war, and emboldened doubtless by the high price which cereals commanded, in consequence of the rupture with Russia, imposed an additional duty on malt, which was estimated to yield £2,450,000 per annum. This additional burden was not removed until 1856, when its abolition was set down as a relief of £2,200,000 per annum. But what was the effect on the consumption of malt? Just this:

MALT CHARGED WITH DUTY.

Year.	Bushels.
1853	42,039,748
1854	36,819,860
1855	33,887,234
1856	37,980,041
1857	40,298,513

Thus, in the year in which the additional duty was imposed the consumption at once went down to the extent of 5,120,388 bushels, and in 1855, when the pressure of the additional tax came into full effect, there was a further declension of 2,982,126 bushels, or 8,052,514 bushels altogether. In 1856—in the course of which year the extra import was removed—there was once a recovery to the extent of 4,092,807 bushels, and in 1857 there was a further advance of 2,318,472

* This calculation is of course based on the hypothesis that every additional bushel of malt produced has been made from barley of English growth. This, however, is far from having been the case, foreign barley having been used to a considerably greater extent than formerly. For the purposes of our argument, however, we put matters in the most favourable possible light from a British point of view.

bushels, making a total revival of 6,411,279 bushels. Can anything indicate more strongly than these figures the effects—the prompt, immediate effects—of impositions and reductions of taxation? Truly, the Chancellor of the Exchequer may be said to hold in his hands the destinies of the commercial world; and it is not at all unfair to conclude that, as the addition of 40 per cent. to the malt tax in 1854 produced an immediate reduction of about 20 per cent. in the consumption, a reduction of 33 per cent. in the duty now levied would lead to an increase of at least 16 per cent. in the demand, in a year or two; so that the present consumption of say 41,000,000 bushels of malt charged with duty would be carried to 47,720,000 bushels in 1865, if the abatement indicated were made in 1864, while a further increase might be anticipated in subsequent years. It is a mistake to talk about the Exchequer not being able to afford the loss of a tax which produces what is generally loosely termed £6,000,000 per annum. In the first place, the tax does not quite yield £6,000,000 annually. In the year ending March 31st, 1855, when the extra war-duty was in force, it produced £6,183,055; in the year ending March 31, 1856, when the same cause was still in operation, it amounted to £6,676,349; but in the year ending March 31, 1857, it fell to £5,690,950; in the year ending March 31, 1858, to £5,326,023; in the year ending March 31, 1859, it was £5,412,777; in the year ending March 31, 1860, it was £6,648,881 (1859-60 having been a good malting season); in the year ending March 31, 1861, it was £6,208,813; in the year ending March 31, 1862, it was £5,866,302; and in the year ending March 31, 1863, it was £5,389,908. Perhaps in the remaining March 31, 1864, the total may rise to a higher point; but, striking an average for the three years ending 1863, we arrive at an average of £5,821,706, which may be taken as a tolerable approximation of the general annual receipt of the Exchequer from this source, with the tax at its present level. A reduction of 33 per cent. upon this sum would involve a loss, then, of £1,940,568 to the revenue; but of this sum one-half, or £970,284, would in all probability be at once made up by the increase in the consumption, and the Chancellor of the Exchequer would still derive from malt the very respectable revenue of £4,951,422, or only £375,601 less than the amount actually received under this head in 1858. With the large surplus, then, at his disposal, Mr. Gladstone might, if he chose, make a reduction at once of 83 per cent. in the tax; and if the farmer's friends are in earnest, they will insist that he shall do so, and press the question to a division.

AN OUT-DOOR CELLAR.—It is very unwise to store a large quantity of vegetables in the cellar of a farmhouse, even if it is of sufficient capacity. In the latter part of the winter there will be some decay; and nothing can be more detrimental to health than living over a mess of decaying vegetable matter. But few cellars are large enough to hold the products of the farm that require winter storage. As we devote more attention to the economical feeding of stock, the necessity of good root cellars will be felt more seriously. Carrots, beets, parsnips, cabbages, and the like, require cellar room. A sandy hill-side is the best place for making a cellar, as in this situation good drainage is secured, as well as easy access. A good cellar, however, can be made in any place where the water will not be within three or four feet of the surface. Especial pains must be taken to secure good drainage. Dig down as far as drainage will allow, and throw the earth back to be used in banking up. If rough stones are to be had, they are best for the walls; if not, posts and planks will answer. A strong ridge-pole is necessary, which must be supported by posts. Bank up the sides with earth, and plank the roof, and cover with straw or leaves, over which rough boards, or something of the kind, must be placed to prevent blowing off. An easy entrance should be made at the front by digging down the earth in a gradual slope; and, as this part will be exposed to the weather, it should be made double, and, if of boards, filled between with straw. Where stone is used, a space for air is sufficient.—*Michigan Farmer.*

THE MALT-TAX.

A SKETCH.

You've all heard of John Bull, the renowned British yeoman—
A firm, steady friend, but a terrible foe man.
Convince John he's right, and he'll "go the whole hog,"
And guard his own premises like that good dog
Which, by way of distinction, is also called "Bull:"
But let any one stroke John "wrong way of the wool,"
Take warning ye authors of taxes unjust—
In his "tight little island" he'll kick up a dust.
Now, John has a weakness—well, call it a failing:
Don't we live in "glass houses?" so what's the use railing?
We're all peas in one pod, and wrapped up in each other,
And hail honest John as our kinsman and brother;
But the heat-tempered fellow that ever was born
Would fight if you purposely trod on his corn.
By the same rule, John grumbles, and holds you in fault,
If you tax his productions with duty on malt.
Now, in one of those quaint, gabled homesteads which crest
England's pastures, friend John Bull has made a snug seat:
There reigns he supreme 'midst his crops and his cattle,
Pays his way like a man, and fights life's up-hill battle.
One evening our hero sat in his arm-chair,
Blowing clouds and misfortunes away in thin air,
When a loud rat-tat put a stop to his dreaming,
And the voice of a friend set John's frontispiece beaming,
'Twas a right "welcome guest"—one of those good old boys
Who lighten our burdens and add to our joys;
And we all of us love him, for, used with discretion,
John Barleycorn (that's the man now in possession)
Does more towards maintaining our place among nations
Than intemperate teetotalers and their stump orations;
And we say, spite of Gladstone's fine rhetoric and parley,
We owe not a little to John and his barley.
Now, behold these two evergreens—rare samples each—
Well worthy the pencil of Touniel or Leech,
Who both, by-the-by, give a portraiture true,
One a week, at the least, and most frequently two:
To prove which assertion refer to your *Punch*,
And you'll find Barleycorn and the Bulls in a bunch.
But I am digressing and wandering away,
So listen to what our old friends have to say:
Said Bull, with a shrug, "Now, confound this taxation;
It spoils all my pleasure, and creates vexation,
I grow the grain—pay pretty dearly for labour;
But here's where the shoe pinches me, my old neighbour:
You've been put on your trial, and fairly acquitted
(Save some time ago by a jury half-witted).
But if of a maltster I purchase a strike,
I must pay a great price, which I don't at all like.
And again, there's that Chancellor talks like a parrot:
He's not going to do me with his nasty claret.
Why, look at my soldiers, whose enemies quail,
They were trained to their duties on beef and good ale.
There's 'blood, bone, and action!' and, mark me, I've said it,
I pocket the profit, but give you the credit.
If sound beer's good for men, why, then, malt's good for
beast.
I maintain that—for that's my opinion at least."
Cried Barleycorn: "If they'd but once let me loose,
With cattle-food condiments I'd play the dence.
I'd upset all gammon and new-fangled notions
Of those advertisers who puff their sour potions.
I'd stick to the ribs of your bullocks and sheep,
Clothe their quarters with fat, and make prime mutton
cheap;
Supply the poor man with a glass of good beer,
And scatter the blessings of peace far and near."
"Then," shouted John Bull, "you're the man for my money!
I will agitate till you are free, my old honey.
Let my sons rally round me, and we'll do our best
To shake off this tax, which is nought but a pest;
And whoever advocates duty on malt
Is a foe to progression, and not worth his salt."
Now, one thing is certain—the Government wheels
Must be kept on the move: all this loyal John feels;
So he begs to suggest Mr. Gladstone will stick it
No longer on malt, but on his railway ticket.
Oakham. W. B. FURLEY.

CALENDAR OF AGRICULTURE.

Sow oats in the whole of the month; also spring wheats, peas, beans, vetches; with flax-seed and lucerne, on well-prepared grounds, at 20lbs. to an acre, and sainfoin at $1\frac{1}{2}$ cwt. to an acre, and dress with gypsum. Sow parsnips and carrots on good lands, and rich with manure; drill at eighteen inches distant on the flat ground, with seeds steeped in leys of urine, or in a solution of nitrate of potass, six to one, and dried by encrusting with hot lime. Top-dress clovers and young wheats with salt, rapeseed, malt-coombs, gypsum, and nitrate of soda, the latter at one to two cwt. to an acre. Sow cabbage seeds for summer plants. Put light stock to graze watered meadows. Set traps and spread mole-hills. Bush-harrow, roll, and finish the dunging of grass lands.

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.

The planting and cutting of timber of any kind

must now be finished. Plant hops on dry lands, trenched, and well prepared. Make the hills at 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.

Send the strong lambs to the natural and artificial grasses, or to the watered meadows. The ewes will now drop lambs very fast, and will claim much attention. Feed amply with juicy food—such as swedes, beetroot, and cabbages—which must be preserved for the most essential purpose.

The fattening of hogs for bacon will cease this month, and the foremost fat bullocks will be sold. Remove all dung to the manure heap, and keep all houses clean. Set hens on eggs for hatching, and exchange eggs with any neighbour. Feed amply, and attend to cleanings, and provide a warm accommodation for the young broods. It is both pleasant and profitable to have a numerous and healthy flock of poultry on any farm.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Begin early to dig, manure, and sow plants for the main crops of peas, beans, and all the summer vegetables; carrots on warm, sandy loams, without any fresh manure, beet and parsnips on stronger lands, with the dung placed low in the ground.

The soil must be rich for cabbage, Brussels sprouts, the broccolis, cauliflowers, and kales; cauliflowers on very rich grounds, with the manure lying in trenches and under the roots of the plants. Guano water is well applied to them.

Transplant and sow for summer hearting cabbage; sow a little Dutch red cabbage seed and green curled Savoy for Michaelmas.

Sow the best French lettuce seeds, and repeat the sowing every three weeks henceforth; in the meanwhile, the winter prickly spinach will continue to yield freely for some months, if the weather prove showery.

Onions: The true Spanish for large bulbs, and the Strasburg for more common kitchen use, should go in early; the ground should be deep and rich. London leeks are sown to be transplanted.

To produce good radishes, the ground must be light and rich, with moisture and warmth sufficient to push them on rapidly. For these reasons, a frame and lights are always beneficial. A sprinkling of Dutch turnip, a little celery for succession, small salad, nasturtiums for pickle, parsley, basil, and potherbs—namely, fenel, dill, borage, burnet, sorrel—are to be sown during the month.

Plant mint, thyme, sage, marjorum, lavender, rosemary, and rue. Get in early potatoes; none

surpass the ash-leaved kidney. The second early, as the champion, prolific, and others that ripen in August, should be ready; and avoiding manure, select or prepare peaty or sandy ground, if possible. Poor dryish soils seem less liable to the potato disease.

FRUIT DEPARTMENT.

Begin to graft apple and pear trees; cherries and plums do better by budding in summer. Trees must be planted by the middle of the month: the roots are puddled in, and covered with an abundance of mulch; for if drought set in, the trees may be fatally checked. Lightly fork the soil between rows of currants, gooseberries, and raspberries; then cover the ground with leafy compost manure.

Do the same by and around rhubarb plants.

FLOWER GARDEN.

Sow hardy annuals after the middle of the month, as the pink, larkspur, and mignonette; the half-hardy are raised in frames. Herbaceous plants may be now set or divided, and placed in new situations.

Cut box, plant edgings, turn gravels, or put down fresh; sweep walks and lawns, and keep all things in neat order.

Dig a pit, and either bricked or cemented, to receive all litters and vegetable refuse, and if possible all horse and cattle droppings, baled over from time to time with liquids and suds from the house. Many articles that are now wasted may be converted into excellent manures, even where a horse, cow, or pig is not kept.

THE METEOROLOGY OF FEBRUARY.

The almost proverbial changeableness of the month of February has received striking confirmation during the period through which we have just passed. Frequent sudden changes have occurred, from cold to comparative warmth, from periods of almost spring-like character to others altogether as gloomy and wintry. The nature and extent of these changes will, perhaps, be sufficiently indicated in the following brief remarks:—

On the 28th of January a minimum value of the barometer occurred, and the day was extremely warm, the mean temperature for the day exceeding its average by $6\frac{1}{2}^{\circ}$. But the barometer turned to increase rapidly, and rose during the two following days, reaching a value of 30.35 inches on the 30th. With this increase in atmospheric pressure colder weather set in, and the temperature for the three last days of January were in defect, as compared with their average value, to the amount of $3\frac{1}{2}^{\circ}$. On the 30th the thermometer fell to 24° , and the thermometer placed on grass fell to 15° . A damp warm period now ensued, and the mean temperature for the first three days of February were in excess above the average value to the amount of 6° . This increase in atmospheric warmth was accompanied by a decrease in atmospheric pressure to the amount of half-an-inch; and a S.W. wind also prevailed during these days, which was occasionally in somewhat rapid motion, on the 3rd day indicating pressures of 7 and 8 lbs. on the square foot. A somewhat lengthened cold period followed, which extended from the 4th to the 11th. During this period large deficiencies of temperature from average values were noted, namely, $10\frac{1}{2}^{\circ}$ on the 7th and 9th, $8\frac{1}{2}^{\circ}$ on the 8th, $8\frac{1}{2}^{\circ}$ on the 10th, and $7\frac{1}{2}^{\circ}$ on the 6th, and the mean deficiency for the eight days amounted to 7° . The lowest temperature during this period, and, indeed, during the month, occurred on the 10th, and was 20.1° , whilst on the grass the thermometer fell to 12° . A north wind prevailed alone on four days, during this period and during the remaining four days, some component direction of the north wind generally prevailed. A little snow fell on the 5th 8th, and 10th, but to almost inappreciable amount.

On the 12th day the barometer reached the minimum value for the month of 29.21 inches, then rose rapidly to the extent of one inch, or to the reading 30.20 inches by the 14th, and then de-

creased rather less rapidly to 29.58 inches by the 16th. During the progress of these rapid fluctuations the weather was constantly warm, and the mean excess of daily temperature values for the five days from the 12th to the 16th, above their corresponding averages, amounted to $6\frac{1}{2}^{\circ}$. The individual amounts of excess in order of magnitude were as follows:— $10\frac{1}{2}^{\circ}$ on the 13th; and 8° , 6° , 5° and $4\frac{1}{2}^{\circ}$ on the 15th, 14th, 16th, and 12th respectively. The wind throughout this period blew from the S.W.; on the 13th with very great violence, registering pressures of 15 to 21 lbs, during some hours. Rain fell heavily on the 12th (which was distinguished by being the dampest day throughout the month) to the amount of one-third of an inch; and also on the 16th to the small amount of 0.05 inch.

On the 17th, cold weather again set in, and continued uninterruptedly till the 25th, which closes our period. During this period of nine days the mean daily defect of temperature amounted to 7° ; the several amounts on separate days being $11\frac{1}{2}^{\circ}$ on the 20th, about $9\frac{1}{2}^{\circ}$ on the 19th and 21st, $8\frac{1}{2}^{\circ}$ on the 23rd, 7° on the 22nd and 24th, and amounts less than 6° on the 17th, 18th, and 25th. The prevalent winds during this period were N. and N.E., and snow fell on seven out of the nine days, but generally in small quantities. It will, of course, be understood that the amounts set down in the rain column in Table, opposite days on which snow has fallen, refer to the amount of melted snow received, and which has been measured in the usual manner.

Glancing over the tables of results, we find that the highest barometer reading occurred on the 30th of January, and was 30.35 inches; the lowest was 29.21 inches, on the 12th of February, giving a range for the month of 1.14 inch. The highest temperature in the shade was 53.8° on the 13th, and the lowest 20.1° on the 10th, making a range for the month of 33.7° . The highest reading in the rays of the sun was 72.5° on the 14th; the lowest on the grass was 12.1° , on the 10th. The dampest day in the month was the 12th; the driest days were the 19th and 21st.

The total amount of rain and melted snow collected from the 28th of January to the 25th of February was 0.71 inch, an extremely small amount. The number of days on which sufficient rain or snow for gauging fell amounted to 12 days.

The past month, therefore, has been chiefly remarkable, firstly, for its great and sudden temperature changes, and, secondly, for the small quantity of rain collected during the month, although spread over rather more than the average number of days

METEOROLOGICAL ELEMENTS FOR THE NEIGHBOURHOOD OF LONDON;
FROM JANUARY 28TH TO FEBRUARY 25TH, 1864.

Month and Day.	Temperature of the Air in Shade.			Highest Reading of a Thermometer in the full Rays of the Sun.	Temperature of Vegetation.*	Degree of Humidity. (Saturation=100).	Amount of Cloud, 0 to 10.	Amount of Rain.	General Direction of the Wind.	Weather Remarks.
	Highest	Lowest	Mean.							
1864.	°	°	°	°	°			Inches.		
Jan. 28	49.5	40.5	44.5	68.7	31.7	74	6.0	0.01	W., N.W.	Fine morn.; overcast, little rain afternoon and night
29	42.2	27.8	34.2	60.5	17.0	72	1.3	0.00	N.E.	Generally clear; fine
30	41.0	24.0	32.8	68.7	15.3	81	5.0	0.00	S.W.	Cloudy morning; clear afternoon and evening
31	42.9	29.9	35.9	69.0	22.7	81	2.0	0.00	S., S.W.	Fine; few clouds
Feb. 1	46.3	31.0	39.2	67.4	21.1	92	6.0	0.00	S.W.	Fine; few clouds by day; overcast night
2	47.7	40.8	44.8	50.6	31.2	93	10.0	0.00	S.W.	Overcast
3	50.0	39.8	45.4	63.0	37.0	87	10.0	0.03	S.W.	Overcast; a little rain
4	42.8	31.6	35.5	53.3	24.1	73	4.3	0.00	WSW., NW	Fine; partially cloudy
5	36.6	27.9	32.7	57.0	23.0	75	5.0	0.03	N.	Cloudy; a little snow
6	36.2	28.9	31.5	48.0	28.8	82	7.5	0.00	N.	Cloudy day; clear night
7	34.6	24.5	28.4	63.0	17.7	83	9.0	0.00	N.	Generally cloudy
8	36.0	26.3	30.5	49.5	20.5	84	5.8	0.01	N.	Cloudy; clear, with snow
9	35.7	22.8	28.3	44.2	14.2	79	5.0	0.00	W., N.W.	Partially cloudy; haze & fog
10	40.0	20.1	30.3	62.0	12.1	73	5.0	0.00	variable	Partially cloudy; a little snw.
11	35.8	31.1	33.5	39.0	29.1	80	10.0	0.00	N., W.	Overcast
12	52.7	32.2	42.7	59.6	19.6	95	7.5	0.33	S.W.	Overcast; clear; heavy rain
13	53.8	43.4	48.5	56.7	37.0	84	7.5	0.00	S.W.	Partially cloudy; thin rain
14	53.3	37.0	44.0	72.5	31.1	83	5.7	0.00	S.W.	Fine; light clouds
15	50.0	40.9	46.0	56.0	37.3	92	10.0	0.00	S.W.	Overcast
16	50.6	37.2	43.2	69.6	34.0	84	8.3	0.05	S.W., W.	Generally overcast; rain
17	44.8	32.3	37.5	64.0	26.2	74	6.8	0.06	N.W., N.	Partially cldy.; rain & snow
18	39.7	28.9	33.8	60.8	24.4	75	5.5	0.00	N., E.	Partially cloudy
19	34.4	26.4	28.9	61.0	23.2	62	7.8	0.01	N.E.	Cloudy; a little snow
20	31.5	23.8	26.9	56.5	23.0	72	8.5	0.01	N.E.	Generally cloudy; snow
21	33.3	26.0	29.2	38.0	25.2	62	10.0	0.00	N.	Overcast; a little snow
22	35.3	29.1	31.5	44.5	27.8	77	10.0	0.00	N.	Overcast
23	37.0	25.0	30.4	49.5	18.5	87	6.8	0.05	E., N.E.	Ovrct. day; clr. nght.; snw.
24	39.3	24.4	32.2	46.4	16.2	82	8.8	0.01	N.E.	Generally cloudy; snow
25	38.0	31.9	34.3	46.0	31.1	85	10.0	0.10	E.N.E.	Ovrct.; snow during morn.

* The "temperature of vegetation" is that obtained from a self-registering thermometer placed on the grass at night. It is therefore a minimum reading for the previous twenty-four hours.

TABLE SHOWING THE PRINCIPAL FLUCTUATIONS IN THE ATMOSPHERIC WAVE, FROM JANUARY 28TH TO FEBRUARY 25TH, 1864.

1864. Month, Day, and Hour.	Reading of Barometer.*		1864. Month, Day, and Hour.	Reading of Barometer.*	
	Highest.	Lowest.		Highest.	Lowest.
	Inches.	Inches.		Inches.	Inches.
Jan. 28, 3 p.m. ..		29.74	Feb. 14, 10 a.m. ..	30.20	
„ 30, 9 a.m. ..	30.35		„ 16, 3 p.m. ..		29.58
Feb. 3, 3 p.m. ..		29.86	„ 19, 9 a.m. ..	30.21	
„ 5, 9 a.m. ..	30.10		„ 21, noon ..		29.52
„ 10, noon ..		29.28	„ 24, noon ..	29.83	
„ 11, 9 p.m. ..	29.67		„ 24, 3 p.m. ..		29.79
„ 12, noon ..		29.21	„ 25, noon ..	29.83	

* All the readings are reduced to the constant temperature of 32 degs.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR FEBRUARY.

The weather having been seasonably fine—moderate quantities of snow having fallen in most districts—vegetation has received a wholesome check. Our accounts from all parts of England are to the effect that the winter wheats are looking remarkably strong and healthy, and that they have suffered little or no injury from the cold easterly winds. The supplies of wheat still in the hands of the growers are unusually large, and of good quality. Although the imports from abroad and our colonies have been on a very moderate scale, and although hostilities have been commenced in Schleswig, no disposition has been shown on the part of the millers to operate beyond immediate wants. The trade has, therefore, been in a most inactive state; and, in some instances, the quotations have had a downward tendency. There has been a moderate, but by no means active sale for fine barley, at full prices. In grinding and distilling sorts, the transactions have been on a limited scale, at barely previous rates. All other kinds of spring corn have moved off slowly. In prices, however, no change of importance has taken place. The inquiry for fine American flour has been tolerably active; but the sale for other kinds has not improved.

The shipments of produce from America during the last two months have been rather limited, owing to the low rates at which it finds buyers in this country. The great deficiency in the growth of Indian corn in the States, last year, is now confirmed; but most of our correspondents state that the Western farmers have immense quantities of wheat in stock. A moderate rise in prices here, therefore, would lead to heavy exports during the spring. At present, there are no signs of higher currencies, even though we have imported only limited quantities of grain. Continental complications, arising out of the present war in Schleswig, may have some effect upon our markets; but, whilst the value of money for commercial purposes continues high, we can hardly anticipate heavy speculative operations, either on the spot, or for forward shipment. Besides, we must bear in mind that our own crop is turning out enormous, and that we now require much less foreign wheat than usual to meet consumption.

There has been a slight improvement in the demand for nearly all kinds of wool. No change, however, has taken place in the quotations. The supplies of colonial wool now in warehouse for the approaching sales—advertised to commence on the 3rd of March—are as follows: Sydney, 9,570; Port Philip, 2,597; Tasmania, 396; Adelaide, 9,247; Cape, 15,235; New Zealand, 1,080—being a total quantity equal to 38,125 bales. Increased supplies on those we have here given will, no doubt, be brought forward, since we find that about 70,000 bales were offered in March, 1863, and 50,000 in the same month in 1862.

Most of the markets have been largely supplied with potatoes in fair condition, and the demand for them has ruled heavy, at depressed currencies—viz., from 40s. to 95s. per ton. Last year, at this time, selected samples realized 120s. to 140s. per ton.

Although the imports of hops have been on a fair average scale, the demand for nearly all kinds has been somewhat active, and previous rates have been well supported. On the whole, the market is well supplied; nevertheless, steady prices are pretty generally anticipated.

The supplies of both hay and straw on sale have been tolerably good; whilst the demand has continued inactive, at barely late rates. Meadow hay has sold at from £3 to £4 5s., clover £4 to £5 10s., and straw £1 2s. to £1 8s. per load. At this period in 1863, the latter article was worth £1 10s. to £1 18s. per load.

Most of the Scotch markets have been fairly supplied with wheat. Selected samples have changed hands to a moderate extent, at full quotations. In other kinds, very little has been passing, at barely stationary prices. Barley and other de-

scriptions of spring corn, as well as flour, have maintained previous rates.

In Ireland, the wheat trade has been devoid of animation. Prices, however, have ruled about stationary. All other kinds of produce have sold heavily, on former terms. The shipments of grain to England have been very moderate. The potato crop has turned out very large, and in excellent condition.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that full average supplies of fat stock have been on offer in the leading cattle markets held during the month, the trade, generally speaking, has ruled steady, and prices have been well supported. For the most part, the beasts have appeared in prime condition, and most breeds of sheep have equalled in quality those shown in the previous month. The butchers, therefore, have continued to purchase somewhat freely, and, with very few exceptions, the stock has come to the scale remarkably well. The low price at which rough fat has been disposed of, however—2s. 1½d. per 8lbs.—has operated seriously against profits, and, to some extent, prevented the usual amount of speculation in both beasts and sheep. The lamb season has opened well; but prices have fluctuated rapidly, owing to the frequent changes in the weather. The most current rates have been 6s. 8d. to 7s. 4d. per 8lbs. There has been only a moderate sale for calves. In the early part of the month, arising from the limited imports from the Continent, the quotations ruled high; but, since then, they have given way to some extent. A full average business has been transacted in pigs—the supplies of which have been large—at steady currencies.

The health of the stock in nearly all parts of the United Kingdom has continued good. Very few losses have been sustained in any locality, and the supply of food has equalled the requirements of the feeders.

Advice from Holland are to the effect that very large numbers of both beasts and sheep are in process of fat-tening for the Metropolitan market. We may, therefore, anticipate extensive importations during the present year; but prices, arising from the enormous consumption going on, are not likely to decline much, if anything, beneath their present level.

In Germany, crossing native with English breeds of sheep has become more general, and, judging from the stock received from that quarter during the last two months, our impression is that, eventually, the efforts now making to produce a more valuable commodity will become successful.

A small supply of beasts has arrived from Portugal; but we can never anticipate large numbers from that country, owing to the length of the voyage and the high freights charged by the various steam shipping companies.

The imports of foreign stock into London were as follows:—

	HEAD.
Beasts	3,289
Sheep	7,323
Calves	1,157
Pigs	460
Total	12,228
Total in Feb. 1863	10,500
.. 1862	3,600
.. 1861	8,485
.. 1860	7,018
.. 1859	7,809
.. 1858	2,320
.. 1857	4,720
.. 1856	3,087
.. 1855	2,839
.. 1854	10,683

The total supplies of each kind of stock exhibited in the Great Metropolitan Market were:—

	HEAD.
Beasts.. .. .	20,422
Cows	469
Sheep	82,540
Calves.. .. .	1,254
Pigs	2,932

COMPARISON OF SUPPLIES.

Feb.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1863.....	19,437	495	75,480	1,067	2,777
1862.....	19,970	510	74,192	786	2,750
1861.....	18,760	500	83,280	934	2,080
1860.....	19,750	322	87,535	974	2,094
1859.....	17,694	499	79,691	1,034	2,357
1858.....	18,276	466	69,070	1,091	1,559
1857.....	17,829	457	74,430	1,172	1,975
1856.....	19,642	495	99,950	678	2,614
1855.....	17,436	385	91,180	596	2,705

The bullock arrivals from our own districts, as well as from Ireland and Scotland, thus compare with last year:—

Feb., 1862. Feb., 1863. Feb., 1864.

Norfolk, Suffolk, Essex, and Cambridgeshire..	10,860	10,260	10,000
Other parts of England	4,660	3,050	4,100
Scotland	1,320	1,860	1,311
Ireland	820	400	470

Beef has sold at from 3s. 8d. to 5s., in some instances at 5s. 2d., mutton, in the wool, 4s. to 6s., ditto, out of the wool, 3s. 8d. to 5s., veal 4s. to 5s. 8d., and pork 3s. 6d. to 4s. 6d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	Feb., 1862.		Feb., 1863.	
	s. d.	s. d.	s. d.	s. d.
Beef.....	from 3 0	to 4 10	3 4	to 4 10
Mutton	3 4	to 5 6	3 6	to 6 0
Veal	4 10	to 5 10	4 4	to 5 6
Pork	3 8	to 4 8	3 8	to 4 8

Newgate and Leadenhall have been heavily supplied with Scotch and country killed mutton. On the whole, a good business has been transacted, at steady prices. Beef has ranged from 3s. to 4s. 4d., mutton 3s. 6d. to 4s. 10d., veal 3s. 8d. to 5s. 4d., and pork 3s. 4d. to 4s. 6d. per 8lbs., by the carcass.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ABINGDON FAIR.—There was a good sprinkling of fine horses for the London trade, which changed hands at very high prices, and for anything of class, size, or quality, sixty or seventy pounds or guineas may be considered a fair value; in fact, from the shortness of the supply of such cattle of late years, increasing prices are asked, and without difficulty obtained. A dull trade for inferior horses. Heifers and cows a fair number on offer, and many of first-rate quality, and where down for calving or in masty condition £18 to £20 per head readily obtained; while some half-dozens fresh oxen, in consequence of the high price beef is making, readily fetched £3 to £4 per head more money; in fact a rise from Puddle fair of at least £2 per head was established, accounted for only from the mildness of the past winter, and much good hay remained unconsumed. Only a few hundreds of fine half-bred tegs were on offer; of these several good lots quickly changed hands at from 48s. to 54s. or 55s. per head.

BATH FAIR.—There was a fair supply of various beasts, a large attendance of dealers, and the fair may be said to have been one of a business character. Good things sold well, and the following prices were realized: Cows and calves £18 to £20, in season heifers £16 to £18 10s., good barreners £15 17s. to £17 10s., steers, which sold very high, £16 to £21, storks and steers £9 to £12. The number of sheep was limited, and 9d. to 9½d. per lb. was paid for prime animals.

BEDFORD FAIR.—The change in the weather caused the trade to be brisk for every description of lean stock; for cows, heifers, and calves ready buyers at top prices. Cattle but a moderate quantity for sale, including a few fat beasts;

prices for fat from 6s. to 5s. 4d. per 8lbs. Cows near calving from £19 to £21 each, others at from £16 to £18, heifers at from £14 to £16, store beasts at from £7 to £11 each. The sheep pens were scarcely half filled; those for sale were quickly disposed of at high prices, best fat wethers making from 6s. to 6s. 4d. per stone, fat ewes from 5s. 6d. to 5s. 8d., lean tegs at from 35s. to 40s. each, ewes in lamb from 45s. to 50s., couples at from 55s. to 60s.

BEVERLEY FAIR.—A great many horses were sold; good animals fetched high prices. There was also a plentiful supply of cattle, which sold at remunerating prices. On the whole the fair was a good one.

BRIDGNORTH FAIR was largely attended by agriculturists and dealers, and there was a good show of stock exhibited. Prime fat heifers fetched 7½d. to 7¼d. per lb., good fat cows 7d. The sheep were excellent in quality, prime wethers realizing 9d. per lb., and good ewes fetching fully 8½d. Fat calves sold at 8d. per lb., and were in demand. Cows and calves sold well, at prices varying from £10 10s. to £16 10s. Good pigs sold from 35s. to £2 2s. each. In the horse fair were exhibited some good agricultural horses and hacks; for the former prices were given from £20 to £30 each, and for the latter from five to fifteen guineas, little business being done, and only a few *bond fide* sales made. There was a small show of family cheese, which sold at from 3d. to 5d. per lb.

CARLISLE HORSE FAIR.—The principal portion of the stock was composed of strong horses for agricultural purposes, generally of a medium and inferior quality. For this class the best demand was experienced. Of inferior classes many were left unsold. Powerful dray horses were very scarce, and for these trade was somewhat active. In hunters nothing worthy of notice was shown. Good riding horses and hacks were a poor show; with few exceptions, the lot exhibited were of an inferior class. Ponies also were scarce, and poor in quality; the better class were looked after, but the midding and inferior were a slow sale. The following are the average prices: Good horses for agricultural use ranged from £20 to £25 and £30, but some picked animals, sold before the commencement of the market, brought as far as £35; medium and inferior £15 to £17, powerful draught horses ranged from £30 to £35 and £40, ponies £8 to £9 and £14. The above are the prices obtained in the market, but during Friday evening and Saturday forenoon sales were effected at higher prices, £50, £55, and £60 being given for superior horses, and £15 and £18 for good ponies.

DEVIZES FAIR.—There was a very full attendance. Store cattle were in good supply, but beef was scarce. Animals of good quality were readily sold, and prices were fully £1 the head over recent rates. Working oxen, of which there was rather a large offer, realised £20 to £30, grazing heifers £12 to £17. The trade was very satisfactory.

DORCHESTER FAIR.—There was a good supply of store cattle, but no fat beasts or sheep, and anything of even possible merit was eagerly sought after. Heifers and cows and calves ranged from about £12 to £16, but one cow and calf went up as high as 20 guineas, and barreners, of which there was a large supply, made from £9 to £13. There was about the usual number of agricultural horses, but pigs were not in very great force.

DUMFRIES HORSE FAIR.—Prices for first-class draught animals were at least 5 per cent. above those of last year's Candlemas fair, but other sorts were under the prices of that time. The best in the market were a pair of bay draught horses, rising six years old, belonging to Mr. Jardine, of Ballygray, for which he sought £140 the pair, and was offered £120, but they were not sold. Mr. M. Teenan sold a very powerful brown horse, rising six years, to Mr. Campbell, Newcastle, at £60; he also sold to the same dealer another horse at £55, and a pair at £100. Mr. M'William, Hardthorn, sold to Mr. Thomas Currie a rare three years old colt, rising four, at £50, and which was re-sold at 60 guineas. Prices for the best draught horses ranged from £33 to £50, and in a few instances up to £60, but the greater number of heavy horses were disposed of at prices between £40 and £48. There was a good show of saddle and harness horses; three years old fillies were selling from £26 to £35, and two years old from £18 to £24.

DUMFRIES PORK MARKET.—Though the pork was killed soft on Monday, the hard frost this morning caused

it to come to the market in capital condition. There was a small show, which, with the favourable morning for curing, had the effect of causing the market to be an unusually brisk one. Prices took an early start, and kept up till the close of the market. So quick and active was the demand, that some of the dealers, though forward at their usual hour, were too late to be able to make purchases; rates advanced 2d. on top lots, and there was also an advance on secondary carcases; the best ranged from 7s. 2d. to 7s. 3d. per imperial stone, secondary from 7s. to 7s. 1d.; a very few heavy and underweight carcases went at from 6s. 6d. to 6s. 10d.

EAST LOOE FAIR was well supplied with fat bullocks and sheep. The fair was well attended, and all the stock was sold. Bullocks fetched £3 8s. per cwt., sheep 8d. per lb.

EXETER FAIR.—The supply of fat stock was exceedingly small, but inferior animals were in much better supply. Fat bullocks 11s. to 11s. 6d. per score, inferior quality 10s. to 10s. 6d.; barreners £10 to £14 each, cows and calves £14 to £18; steers from £20 to £30 per couple.

GLASTONBURY MONTHLY MARKET was about the average. The supply of heifers and sheep was numerous, and fetched good prices. Pigs were neither numerous nor much in request.

GLOUCESTER MONTHLY MARKET.—The supply of cattle and sheep was rather above the average for this season of the year; the quality, too, was generally good, and a ready sale and an early clearance were effected at the following prices: Beef 6½d. to 7½d., Mutton 8d. to 9d. per lb., Pigs 9s. to 9s. 6d. per score.

NEWTON-STEWART HORSE MARKET.—There was about an average number of animals exposed for sale, but mostly of a very inferior sort; a few sales were effected at extremely low figures; the highest prices we could hear of obtained in the market was £26 for a draught horse, and prices ranged from that figure down to 26s.

NORTHALLERTON FAIR.—Horses of all descriptions were offered, and sold at low figures, many remaining on hand. There was a small supply of fat stock, which sold at 7s. 6d. to 8s. 8d. per stone. A large number of store cattle had dull sale, many remaining on hand, although rates were low. In-calfing cows were plentiful. Prime ones sold well, but those of an inferior description went at low prices.

PENRITH HORSE FAIR.—There was a large show. The animals shown were mostly cart horses, but there were also a few hacks and young ponies. Several cart horses were sold at prices varying from £15 to £20. The largest show may be expected next week.

STRATHDON FAIR.—The demand was good, and a great number of sales were effected. Mr. Ross, Ballachduie, Glenbucket, sold three stots; Mr. Keir, Clachachdu, Strathdon, sold three one-year-old queys for £24; Mr. Simpson, Shianoch, sold a pair of queys for £18 5s.; Mr. Gauld, Auchavaich, Glenbucket, sold two stots for £27 10s.; Mr. Dunbar, Bleniden, Strathdon, sold a calving cow for £12 5s.; Mr. M'Grigor, Torrinduie, sold two stots for £36; Mr. Michie, Newbigging, Towie, bought two queys for £14, and one for £8; Mr. G. King, miller, Bellabeg, sold three calves, eight months old, for £22; Mr. M'Grigor, Torrinduie, sold a pair of stots for £31; Mr. Bremner, Manse of Glenbucket, sold a calving cow for £15 11s.; Mr. John M'Grigor, Torrinduie, sold one at £15 5s., and two for £16; Mr. Simpson, Wester Skene, sold two at £8 a-head; Messrs. Kellas, Culquhonnies, sold one stot and one quey for £33, two stots and one stirk for £32, two stots for £31, and a cow for £18; Mrs. Grassick, Coul, sold two stirks for £22 10s.; Mr. King, Bellabeg, bought a quey for £10 12s. 6d.; Mr. Ironside, for Sir Charles Forbes, Bart., of Newe, sold two stots for £52 5s., also two queys for £48.

TENBURY FAIR was but scantily supplied with stock, with a good attendance of buyers, consequently the trade was brisk for store animals and cows and calves. Of fat stock there were scarcely any, and those at late prices. Pigs were higher.

WINCHESTER FAIR.—Cattle were moderately supplied, and fetched ordinary prices. A great number of horses of indifferent character, except the agricultural sorts; prices were middling. Pigs were scarce and prices higher.

WINSLOW FAIR.—There was a good show of cows in-calf. Cows and heifers were also slow of sale. Weaned calves

found buyers at prices quoted in late reports; the few fat calves were sold quickly. Prices as follows: Cows in profit or near calving made from £17 to £19 each, barren ditto from £14 to £16, heifers from £13 to £15, young heasts for grass-feed from £8 to £10, calves from 16s. up to 40s. each. Fat cattle at from 11s. to 12s. the score pounds. A moderate quantity of fat and lean sheep, which were sold at high prices, but Oxfordshire and other Down wethers made full 6s. the 8lbs., other half-breds 5s. 10d. Store tegs 30s. to 40s. each, ewes near lambing 45s. to 50s., ewe and lamb 50s. to 55s. Pigs in good quantity. Fat porkers sold at from 6d. to 6½d., large ditto 5½d. to 6d. per lb. Small store pigs from 14s. to 18s. each, large ditto from 25s. to 35s., sows at from £4 to £5.

WORCESTER FAIR.—Attendance of buyers large. The show of stock was very good in beef. Scarce supply of mutton. All sold at prices satisfactory to sellers. Beef reached 7d., mutton 9d. to 10d. per lb. Show of stores very indifferent in quality and quantity, both in barrens and cows and calves, but a good demand; prices ruled high. Pigs on the advance, and a good trade done at from 9s. to 10s. per score. Store pigs full 10 per cent. higher than at last fair. Not much doing in horses.

IRISH FAIRS.—**PORTUMNA** was well attended, and stock presented for sale realized remunerative prices. **PARSONSTOWN**.—The supply of stall cattle was good, the demand brisk, and prices remunerative, finished cattle bringing 60s. per cwt. Milch cows were in great request. There was a quick demand and good prices for store cattle, the prices ranging up to £12 10s. The supply of sheep was good, and fair demand for all of a superior description. There was a large show of horses, almost all of which being only fit for draught or agricultural work, low prices were demanded, yet the sales were very few. Supply of bacon pigs good; some of which brought as high as £5 10s. Prices ranged from 40s. to 42s. per cwt. Of store pigs a good supply and brisk demand, with an advance in prices.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, MONDAY, Feb. 22.—During the past week the arrivals both coastwise and by rail have been more than equal to the demand, and trade continues much in the same state. The following are this day's quotations:—

Yorkshire Flukes	per ton	70s. to	90s.
" Regents		50s. to	70s.
" Rocks		45s. to	50s.
Dunbar Regents		70s. to	75s.
Kent and Essex Regents		50s. to	70s.
North Berwick Regents		50s. to	60s.
Perth, Forfar, and Fifeshire Regents		40s. to	50s.
" " Rocks.		40s.	

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, Feb. 22.—The fresh arrivals of home-grown potatoes to these markets are very moderate, but the supply of stale produce on offer is somewhat extensive. Good and fine samples are in fair average request, at our quotations; otherwise, the trade is very dull. A few small parcels arrived from Holland last week.

Kent and Essex Regents ..	60s. to	75s.
Yorkshire Regents	60s. to	80s.
Ditto Flukes	85s. to	95s.
Ditto Rocks	50s. to	60s.
Scotch Regents	55s. to	70s. per ton.
Ditto Rocks	45s. to	55s.

COUNTRY POTATO MARKETS.—**MANCHESTER** (Saturday last.): Potatoes, 5s. to 8s. per 252 lbs.—**DONCASTER**, (Saturday last.): A good supply of potatoes, which met with a heavy demand, at the following prices: wholesale, 4s. 6d. to 6s. per 18 stones; retail 6d. to 8d. per peck.—**YORK**, (Saturday last.): The market is completely glutted with potatoes, and it is with difficulty they can be disposed of, although the prices are so low. They sold at from 4s. to 4s. 6d. per tub of 280lbs., and 5d. to 6d. per peck retail.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

February on the whole has been frosty beyond the average of seasons, though in its midst some of the days were mild and almost warm. Frost has also reappeared on the Continent, and a very deep fall of snow has occurred in France. The alternations of temperature have been destructive to esculents—many potatoes have been frosted, and much rot has occurred among the turnips, and the largeness of the last crop of corn is now likely to be liberally drawn upon for the sustenance of cattle, especially should the spring be protracted. We have not had sufficient snow for the covering of the wheat, and on the light lands it is said to be much cut up, but the general appearance of the plants on stronger and well cultivated soils remains favourable. The changes from dry to fog and damp have been hurtful to the condition of samples; and this circumstance, connected with the uncertainty in politics, has been rather unfavourable to prices, while the stringency of the money market, though somewhat lessened, keeps speculation greatly in check. The moderate decline in the general averages—say, in the course of four weeks, from 41s. 3d. to 40s. 8d.—pretty well describes the state of markets, and the tendency has remained downwards at the close of the month. All eyes have been turned towards events in Denmark, and the consequences of the invasion of the Austro-Prussian armies, which already have produced the blockade of the German ports, and exposed every flag of that nation to be captured by Danish cruisers. Here then is the commencement of curtailed supplies; but should British neutrality last, much corn may yet arrive in English bottoms. But with complications multiplying as the strife is prolonged, an European war seems gathering in the horizon, from which it will be difficult for our Government to keep clear. The tabulated accounts recently furnished in the *Mark Lane Express* give us some assurance that so far as home produce is concerned we are partly prepared for a rupture with corn-producing countries; but, if our surplus beyond an average be only five millions of quarters, we should be hard put to it against next harvest without some foreign help; and, with such a low range of prices—say almost 20s. per qr. below what they were in 1862 at this time of year—there is ample prospect for remuneration to such as can hold, while there is scarcely a possibility, under any circumstances, that rates can sink materially, and that only for a time. One thing is certain—that with foreign stocks only moderate, importers here are little disposed to throw away their chances; and though new Dantzic wheat for spring is offered at 41s. per qr., freights are rising fast; so there is not much chance, even with peace on the part of England, of its arriving in London under 50s. per qr. The following rates have recently been current in foreign parts. Wheat

prices in Paris have ranged from 38s. to 43s. Choice quality of native at Louvain 45s., red American at Antwerp 42s. 6d., fine high-mixed Danzig at Amsterdam 50s. per qr. American red 43s. 6d., Rhenish 42s. 6d. The best Saale red and Marks at Hambro' was quoted 41s., red Pomeranian at Stettin 36s. 6d. per qr. At Straubing in Bavaria 40s. In Porrentruy, Switzerland, the top quotation was 45s.; native wheat at Cologne 41s. at Mayence 40s. 6d. per qr. Wheat at Venice 43s. to 46s.; soft red at Algiers the same. New York, perpetually influenced by the varying exchanges, quoted the following rates, which, at 175 per cent. exchange, would be for Chicago spring wheat 32s., amber 33s., red winter 34s. 6d. per 480 lbs.

The first Monday in London commenced on a small English but good foreign arrival of wheat, including about 12,000 qrs. from Danzig and Baltic ports. There were not many samples this morning from Kent and Essex; but, with the good foreign supply, millers were little disposed to do business, and though only former rates were demanded most of the bulk remained unsold. Warlike rumours made holders of foreign firm, but very few sales were effected. With few offers of floating cargoes former rates were maintained. The doubtful aspect of politics found a counterpart in the state of the country markets. Generally, there was more tone than in London. Hull, Stockton, Boston, and many of the Saturday's markets were 1s. per qr. higher, and Newark noted a rise of 1s. to 2s. per qr., but some places remained dull. Liverpool was dearer at the Tuesday's market 4d. per cental, but Friday's report was quiet. Glasgow was only firm for wheat, but Edinburgh advanced 1s. to 2s. per qr. The Irish markets were steady, and holders of foreign at Dublin were too high in their pretensions for business.

The supply on the second Monday was small, particularly so in foreign qualities. The show on the Essex and Kentish stands this morning was also trifling, and the changes in the weather had affected the condition. Sales were made very slowly at the previous Monday's rates. Holders of foreign remained firm, especially so for good old qualities, which sold in retail at former prices, but new was neglected. Cargoes afloat were held at quite the previous Monday's quotations, but the inquiry was languid. With peace more evidently the prevailing policy of England, there was a general dulness throughout the country wheat markets this week, Hull, Bristol, Birmingham, and Boston being rather in favour of buyers; but there were some exceptions, Sheffield, Spilsby, Ipswich, Rugby, and a few others places being among them. Liverpool was dull all through the week, with prices scarcely supported. Glasgow rather gave way, and Edin-

burgh was about 1s. per qr. lower. At Limerick and Waterford wheat sold more readily, but most of the Irish markets were heavy.

On the third Monday there was but a moderate arrival of Wheat from abroad, with the usual quantity of home growth. The morning's show from Essex and Kent was unusually small, and not in very good condition. Notwithstanding the limited offers of English, the market was very depressed, all apprehensions of British intervention being dissipated, and scarcely anything was sold, though for the best samples factors would gladly have accepted a reduction of 1s. per qr. The foreign trade was equally dull: some samples of red white were sold at fully 1s. per qr. less money; but holders of all fine old samples were firm from its scarcity. There was very little doing in floating cargoes. The dull accounts from London again influenced country advices, and several of the wheat markets were 1s. per qr. cheaper. Among these were Boston, Bristol, Gainsboro', Market Harbro', Manchester, Newbury, Sheffield, Stockton, and Spalding. Liverpool noted no change on either market, Friday being firm. The principal Scotch markets were 1s. per qr. lower, as Glasgow and Edinburgh; but at Dublin trade in foreign was only dull.

The fourth Monday opened on a small supply of English Wheat, with a moderate arrival from abroad, about two-thirds being from the Baltic, and the rest from New York. Very little appeared this morning on the Essex stands, and not much on the Kentish; the latter comprehending most white in fair condition, the remainder being rough. Millers were again very careless about buying, though factors at first asked rather more money. In the end but little was done, and that at the previous rates. The foreign trade consisted mostly of retail sales in good old red, and some fine white qualities at unaltered terms. Very little was passing in floating cargoes, which were held for the same money. The arrivals in the port of London for four weeks were 22,108 qrs. English, 51,647 qrs. foreign, against 16,113 qrs. English and 42,922 qrs. foreign for the same period in 1863. The country advices this week were mostly dull, but with very little change.

The flour trade has been exceedingly dull throughout the month, and sales could not be made freely either in country marks or foreign, without some concession to buyers, though quotations have stood pretty much the same, and the top price of town qualities has continued to be 40s. per sack. The imports for four weeks into London were 71,159 sacks country-make, 11,674 sacks 6,319 brls. foreign, against 62,382 sacks country, 1,763 sacks 40,930 barrels foreign; showing a great falling off in American imports as regards this period of the year.

The barley trade has been also extremely dull on but moderate supplies, both English and foreign. The English crop was evidently a good one; and though not much fine has made its way to London, maltsters have found no difficulty in obtaining what they required in country markets, or for secondary

qualities in foreign imports. The best malting cannot be reckoned as worth over 38s., while grinding foreign in granary has been offering at 22s. per qr., 50lbs. per bush., and some sweet 54lbs. been sold at 25s. These rates seem too low for a further reduction, especially as the rise in maize throws the consumption more upon this grain. The imports into London for four weeks were 19,700 qrs. British and 43,486 qrs. foreign, against 14,730 qrs. British and 49,348 qrs. foreign in 1863.

Oats have about maintained their value, excepting foreign sorts of low quality, and some sales of the better kinds have been made at low rates, viz., 40lbs. per bush., swedes being sold on the last market at 19s. 3d. Irish oats, only being in good supply recently, have not varied at all in value, 40lbs. being saleable at 19s. 6d. per qr., and 42lbs. fine at 22s. per qr. The general expectation of some improvement, in consequence of the war in Denmark, has hitherto been disappointed; but rates are so low, there appears more chance every way for a rise than a decline. Old oats having become scarce, have been firm. The imports for four weeks into London were in English sorts 27,430 qrs., Scotch 13,689 qrs., Irish 18,265 qrs., foreign 52,707 qrs., against 17,696 qrs. English, 733 qrs. Scotch, 769 qrs. Irish, 20,270 qrs. foreign in 1863, showing a considerable increase this year.

The bean trade has also been dull and declining, say fully 1s. per qr., and on some new sorts, as harrows, rather more. The fluctuating character of the weather has prevented any continuous demand for either English or foreign, notwithstanding the low rates which have ruled; all depends on the character of the spring whether any advance will be likely to take place, but we are inclined to think well of future prices, as they have advanced in Egypt and on the Algerine coast, and are too dear for shipment from France. Fine new harrows have been selling at 34s. The imports into London for four weeks were 5,923 qrs. English, 1,788 qrs. foreign, against 2,594 qrs. English and 15,022 qrs. foreign for the same period in 1863, showing a very heavy falling off in foreign, while the English supply has doubled.

Peas have been more difficult of sale than beans; but with only small English and very short foreign supplies their value has remained about the same as last month. The productiveness of the crop of seed peas has thrown a good many fine blue upon the market for common use, and they have only brought from 35s. to 38s. per qr., though some were recently worth near 70s. per qr. Fine white boilers were worth about the same in retail. The imports of all sorts into London for four weeks were 2,554 qrs. English and 875 qrs. foreign, against 1,470 qrs. English and 1,814 qrs. foreign in 1863.

The Linseed trade, after three weeks' short supplies, had a very heavy arrival from the East Indies, but the whole of it being wanted for home use and a free export demand, former rates have been fully supported, though the sale of cake has slackened.

The rough variable weather has been much against the seed trade. Red cloverseed had been

rising, more especially fine English, as well as foreign sorts, but with the exhibition of numerous low English samples business has lately become restricted. Trefoil has improved in value. Canary has rather gone back. Tares, both large and small, have been more in request, the former at 46s., the latter at 32s. per qr. Mustardseed has only found a retail inquiry at former rates.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter.
WHEAT, Essex and Kent, white.....new 41 to 48 old 40 to 46	
" " red..... " 40 42 " 40 42	
Norfolk, Lincoln, & Yorksh., red " 40 42 " 40 42	
BARLEY, new.....24 to 30.....Chevalier. 30 38	
Grinding.....28 35.....Distilling. 27 30	
MALT, Essex, Norfolk, and Suffolk.....new 60 66	
Kingston, Ware, and town-made..... " 60 66	
Brown..... " 50 56	
EYE, new..... " 32 33	
OATS, English, feed 18 to 23.....Potato..... 21 25	
Scotch, feed " 18 23.....Potato..... 21 25	
Irish, feed, white 15 19.....fine 20 21	
Ditto, black, new 16 19.....Potato, new " 19 22	
BEANS, Masagan " 29 30.....Ticks..... 29 30	
Harrow..... 32 35.....Pigeon..... 35 40	
PEAS, white, bolters 26 38.....Maple 25 to 36 Grey 30 31	
FLOUR, per sack of 280 lbs., Town, Households..... 36 40	
Country.....28 to 31.....Households..... 31 33	
Norfolk and Suffolk, ex-ship..... " 27 30	

FOREIGN GRAIN.

	Shillings per Quarter.
WHEAT, Dantia, mixed.....48 to 50.....extra 52 to 55	
Konigsberg.....47 49..... " 50 51	
Rostock.....44 46.....fine 46 47	
Silesian, red.....42 44.....white 43 48	
Pomeria, Meekborg, and Uckermark, red..... 43 46	
Danish and Holstein, red..... 41 44	
Russian, hard 37 to 41..... St. Petersburg and Riga 38 43	
French, none.....Rhine and Belgium..... 43 45	
American, red winter 43 46, spring 43 43 white 46 49	
BARLEY, grinding.....22 to 24.....distilling and malting 35 39	
OATS, Dutch, brew, and Poland's.....17 to 21.....feed. 15 20	
Danish and Swedish, feed.....16 to 21.....Stralsund. 19 21	
Russian, Riga 19 to 20, Arch., new 18 to 19, P'sburg 19 21	
BEANS, Friesland and Holstein..... 32 36	
Konigsberg..... 30 to 35 " Egyptian..... 30 32	
PEAS, feeding and maple.....34 36 " fine bolters. 35 37	
INDIAN CORN, white.....29 32 " yellow..... 27 30	
TARES, " pring 30s. to 32s. per qr..... Lentils 28 30	
FLOUR, per sack.....French 34 37.....Spanish, per sack 34 37	
American, per brl.....19 to 23.....extra and dble..... 25 27	

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. 9, 1864.....	40 2	31 7	18 8	29 7	34 2	23 3
Jan. 16, 1864.....	40 11	31 10	18 10	28 0	33 7	23 1
Jan. 23, 1864.....	41 8	32 5	18 9	28 0	33 8	23 8
Jan. 30, 1864.....	40 8	32 1	18 11	31 8	33 3	23 0
Feb. 6, 1864.....	40 4	32 0	18 9	29 0	33 8	23 0
Feb. 13, 1864.....	40 8	31 11	18 9	29 1	33 7	23 7
Aggregate Average.....	40 8	32 0	18 10	29 2	33 8	23 3
Six months last year.....	47 7	35 6	20 9	34 7	36 5	27 4

COMPARATIVE AVERAGES—1864-63.

From last Friday's Gas.	s. d.	From Gazette of 1863.	s. d.
Wheat.....10.3906 qrs. 4	8	Wheat..... 74260 qrs. 47	2
Barley..... 84464 " 31	11	Barley..... 72404 " 36	3
Oats..... 12906 " 19	1	Oats..... 17054 " 21	8
Eye..... 69 " 29	1	Eye..... 14 " 33	0
Beans..... 6158 " 32	7	Beans..... 5257 " 36	7
Peas..... 1501 " 38	7	Peas..... 1234 " 37	10

FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT.



PRICES OF SEEDS.

LONDON, MONDAY, Feb. 22.—The return of unfavourable weather has checked the trade in seeds of all descriptions, and the business during the past week has been very small. The supply of English is much reduced, but without demand; sales are difficult to make. The quantity of foreign red offering is small, and held for firm prices. White seed is a very slow sale. Trefoils are firm in value. Canaryseed sells slowly, and maintains its value.—CUTLER & BARKER, Seed-factors.

BRITISH SEEDS.

MUSTARD, per bush., white.....	9s. 6d. to 10s.
CORIANDER, per cwt.....	14s. 16s.
CANARY, per qr.....	56s. 64s.
TARES, winter, new, per bushel.....	6s. 6s. 6d.
TREFOIL.....	24s. 27s.
LINSEED, per qr., sowing—s. to 72s. crushing 58s. 64s.	
LINSEED CAKE, per ton.....	£9 10s. to £10 10s.
RAPSEED, per qr.....	62s. to 65s.
RAPSEED CAKE, per ton.....	£5 10s. to £6 0s.

FOREIGN SEEDS.

CORIANDER, per cwt.....	16s. 16s.
CARAWAY ".....	—s. —s.
TREFOIL.....	22s. 24s.
CLOVERSEED, red 41s. to 50s., white.....	50s. to 60s.
LINSEED, per qr., Baltic 58s. to 60s.....	Bombay 68s. —s.
HEMPSEED, small —s. per qr., Dutch.....	—s. 42s.
LINSEED CAKE, per ton.....	£9 10s. to £11 0s.
RAPSEED, Dutch.....	—s. to —s.
RAPSEED CAKE, per ton.....	£5 0s. to £6 0s.

HOP MARKET.

BOROUGH, MONDAY, Feb. 22.—Our market continues quiet, with a moderate demand for the few home growths on offer. Foreign hops, particularly Americans, are more abundant, and prices are a shade easier.

Mid and East Kents.....	120s., 140s., 180s.
West of Kents.....	115s., 130s., 145s.
Saxex.....	105s., 120s., 130s.
Bavarians.....	105s., 135s., 168s.
Belgians.....	80s., 84s., 95s.
Americans.....	105s., 120s., 132s.

MEASE & WILD.

PRICES OF BUTTER, CHEESE, HAMS, & C.

BUTTER, per cwt.—	s. d.	CHEESE, new, per cwt.—	s. d.
Frisian.....	128 to 137	Cheshire.....	60 to 70
Jersey.....	104 116	Double Gloucester.....	60 66
Dorset.....	— " —	Cheddar.....	64 78
Carlow.....	98 114	American.....	44 56
Waterford.....	98 110	HAM: York, new.....	90 94
York.....	98 110	Cumberland.....	90 94
Limerick.....	90 104	Irish.....	80 84
Sligo.....	96 110	BACON: Wiltshire, dried.....	60 64
Fresh, per doz. 12s. 0d. to 16s. 0d.		Irish, green.....	52 56

ENGLISH BUTTER MARKET.

LONDON, MONDAY, Feb. 22.—The new milk Dorset Butter is now coming forward, and for the first time we give quotations for price.

Dorset, fine new..... 136s. to 138s. per cwt.

" middling nominal.

Fresh..... 13s. to 16s. per doz. lbs.

GLASGOW.—Small arrivals of cheese, but the market well supplied from last week. Business considerably more active. About 16 tons passed the weigh-house. No alteration in prices. Dunlop 51s. to 60s., Cheddar made 50s. to 62s.

OIL MARKET.

OILS.	PITCH.
Olive, Florence, } £1 4 0s. 40 0 0	British (per cwt.) } 40 0 0 0 0 0
half-chestn. } 1 0 0 0 0 0	Archangel..... } 0 10 0 0 0
Lucca..... } 1 0 0 0 0 0	Stockholm..... } 0 12 0 0 0
Gallipoli (253 gals) } 58 10 0 0	
Spanish..... } 55 0 0 0 0	
Linseed (cwt.) } 0 0 0 1 15 0	TURPENTINE.
Rape, Pale..... } 2 1 6 2 2 0 0	French (per cwt.) } 45 14 5 0 0 0
Brown..... } 1 19 0 0 0 0	American..... } 4 5 0 0 0 0
God (ton)..... } 51 0 0 0 0 0	Rough..... } 0 0 0 0 0 0
Seal, Pale..... } 43 0 0 0 0 0	
Do. Brown, Yol. } 0 0 0 0 0 0	TAR.
Spermac..... } 75 0 0 76 0 0	American..... } 40 0 0 0 0 0
Head Matter..... } 73 0 0 74 0 0	Archangel..... } 1 5 0 0 0 0
Southern..... } 48 0 0 0 0 0	Stockholm..... } 1 2 0 0 0 0
Cocoa-nut (cwt.) } 1 19 0 2 5 0	
Palm..... } 1 16 0 1 15 0	

RESIN.

French Bral clair } 41 5 0 0 0 0	Greenland, full } 43 6 0 40 0 0
" Bral noir } 1 5 0 0 0 0	use (per ton).....
	South Sea..... } 40 0 0 0 0 0



J. H. B. 1887

W. H. D. 1887

Chickens

The illustration depicts the first step of the Chickens in the United States. It is a very important step in the history of the Chickens in the United States. It is a very important step in the history of the Chickens in the United States.

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NEW SERIES.

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1864.

NO. CXI.

PLATE I.

OAKBUD; A PRIZE SHORTHORN.

THE PROPERTY OF MR. CHARLES SWAISLAND, OF CRAYFORD, KENT.

Oakbud, bred by Lady Lubbock early in 1860, is by Louis (14861), out of Oakleaf by The Prior (13370), her dam Oak by Mozart (11380); — Snailhorn, by Young Frederick (3836); — Old Snailhorn, by Favourite (3768); Strawberry 2nd, by Commodore (1858); —, by Favourite (3768); — by Tathwell Studley (5401) — by a son of Waddingworth (668).

Oakleaf, the dam of Oakbud, was also bred at High Elms, by Sir J. W. Lubbock., Bart., in April, 1855.

Oakbud has only been exhibited on three occasions, her opening-day being at the Dartford and Farningham Show in December, 1862, when she took the first prize as the best fat heifer, and the extra prize as the best fat animal in the yard. After a year's more ripening she went on to Birmingham, in December last; when she carried off the following accumulation of premiums: £15, as the best Shorthorn heifer; £25, as the best of all the Shorthorns; the Gold Medal, as the best of all the cows or heifers; and the Innkeepers' Cup, value 25 gs., as the best animal in all the cattle classes. At the Smithfield Club Show, in the week following, Oakbud again took the first prize of £25, as the best Shorthorn heifer, and the Silver Cup, value £40, as the best heifer or cow in any of the classes—in fact, all that was possible, with a silver medal for Lady Lubbock, as her breeder. We thus spoke of this famous heifer on first meeting with her in Bingley Hall:—

“The best of all the Shorthorns, as with the best of all the Herefords, was in the heifer class, where Mr. Charles Swaisland, a gentleman not much known to fame in this way, sent one very near perfection. Very grand in her frame and true in her symmetry, this heifer has fed wonderfully level, and it is rarely that any animal carrying so much flesh has had it so evenly laid on. She is, indeed, the very model of a fat beast, although in achieving this she has necessarily lost something of the female character that might have been developed had she been kept for other purposes. Her back

is extraordinary, and her touch excellent; but if we were prone to find fault, it would be with her withers; while her hoofs have been terribly neglected, though this is not observable until the animal is led out. However, these were mere trifles in comparison with her other manifest merits, and so the Kentish heifer was declared to be not only the best of her class, but the best of the Shorthorns; then the best of all the cows, and, of course, when it came to the deciding heat, the best animal in the yard, as she had already defeated the prize medal ox, when confined to their own ranks. The Shorthorns, consequently carried all before them, winning the three grand premiums for the best ox, the best cow, and best animal of all the show; neither of these, however, were eligible for Lord Chesterfield's prize for the best ox bred and fed by an exhibitor, which still went the same way to Mr. Stainforth's Shorthorn steer. Mr. Swaisland, the owner of this now famous heifer, resides at Crayford, and was very successful at the Maidstone show last summer, where the stock was entered in the name of himself and his partner Mr. Stable, when we thus wrote of them: ‘The heifers under two years old, the first exhibited by Swaisland and Stable, and the second by Mr. Betts, were both very good, and for breed and substance about the best pair of Shorthorns in the show.’ Mr. Swaisland bought the chief lots at Sir John Lubbock's sale.”

Oakbud, in fact, was the first pure-bred Shorthorn Mr. Swaisland ever possessed, and he purchased her when a calf of only a fortnight old; but he has since secured several calves and heifers of the same blood, and crossed this with a strain of the Royal Butterfly. After such a beginning and with such a foundation it is consequently not improbable that the Crayford herd will again figure prominently in the prize list. It is rarely, however, that so young a herd went so soon to the front. Oakbud herself is to have a chance here, as she is still in the possession of Mr. Swaisland, who is trying to breed from her.

PLATE II.

THE COLONEL; A PRIZE SUFFOLK STALLION.

THE PROPERTY OF MR. HERMAN BIDDELL, OF PLAYFORD, IPSWICH.

Mr. Herman Biddell purchased The Colonel of his brother, Mr. Manfred Biddell, who, being very sweet upon him as a colt, designed he should take the place of his Chelmsford prize horse Major, then suffering from an accident to one of his fore legs. In 1859, The Colonel was sent in a kind of "grass-fed" plight, to compete among the two-year-olds at Warwick. Here he gained nothing save a clever habit of stepping in and out a horse-box, by no means a useless accomplishment, as in after-years he travelled more than 1,000 miles by rail, as competitor at different agricultural shows. In the spring of 1860 he made an excellent season, but in the autumn of that year his colour from a good red turned to a dark chesnut, an offence in his owner's eyes only to be expiated by immediate banishment from the Luck's stables. Upon certain conditions of not travelling him on the Luck's circuit, Mr. Herman Biddell consequently became the possessor of the ex-favourite, with the avowed intention of one day having his name enrolled among the Royal Society's list of conquering heroes, with, perhaps, an off-chance at the county meetings, when the item of "colour" was not so vital a point with the judges for the day. The Colonel's career, however, was by no means an unchequered one, although his fine action and general appearance mostly brought him well up with the winner. His performances in 1861 included a blank at the county meeting at Ipswich; next to the winner, in a field of fifteen, for the open prize at Romford; and a commendation from the judges at the Royal Society's Meeting at Leeds. He was shown twice during the following summer—at Bury, where he gained a second (to Chester Emperor), and at Battersea, when the £30 prize, in a field of eighteen, gave him a claim to be placed in

the gallery of Royal winners of the *Farmer's Magazine*. With the exception of his colour, The Colonel is an excellent specimen of the modern Suffolk horse, with as good action and as grand an outline as ever were seen in a cart horse. He stood, at Battersea, 16 h. 3 in., and girthed 8 ft. 1½ in., with the cord very tight; was never sick, lame, ill-tempered, or out of spirits; he required neither veterinary aid, picked hay, nor Thorley's food to bring him to an appetite. He had the most perfect shoulders, the widest of backs, and the best of feet, and could always command the highest recommendation of a member of the R. C. V. S.

The Colonel, bred by Mr. Read, of Rendlesham, is a son of Biddell's Major, a prize winner at the Royal Society's Meeting at Chelmsford in 1856, and by Catlin's Duke, also a Royal prize winner, having ranked first at Windsor in 1851. Duke's sire was Manchester Boxer, a horse sold by the late Mr. Catlin to the Duke of Manchester, for 300 gs.; and this horse in turn was a son of Catlin's whitefaced Boxer, descended through Artis's Boxer, Groom's horse, Brady's horse, to Smith's horse, of Parham, of which there seems to be no further pedigree to be traced. The dam of The Colonel, a very fine short-legged mare of the old stamp, was by Benham's Briton, a son of Utting's Boxer by Cottingham's horse, which was a son of Plant's horse, of Bulkham, an animal reported to have flourished about the time of the Battle of the Nile!

The Colonel was sold at the Battersea Show to the Earl of Talbot and Shrewsbury, who can now boast of being the owner of the only horse in England, which himself, his sire, and his grandsire each carried off a Royal Agricultural Society's prize.

MR. DRIFE'S BLACKFACED RAM.

[The following letter only reached us after the Magazine for March had gone to press.]

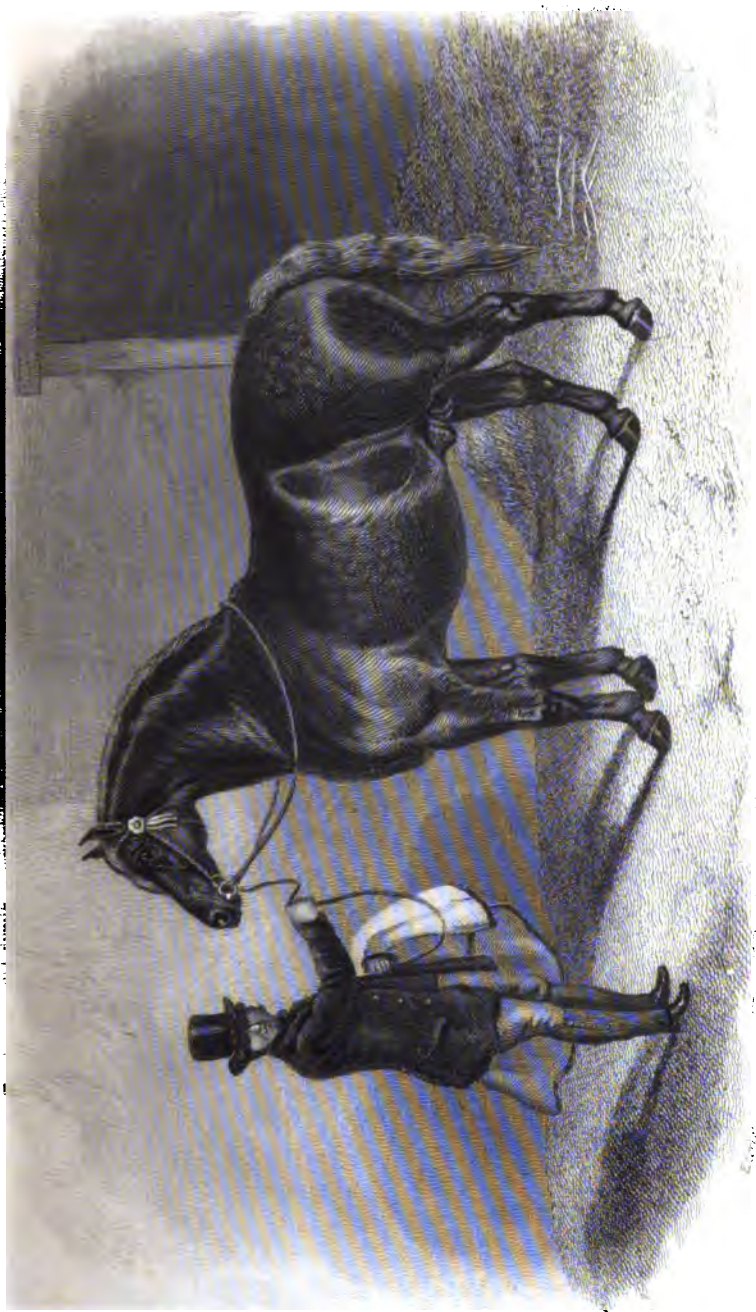
SIR,—The winner of the first prize at Battersea is still my property. I purchased him when a year old, from his breeder, Capt. Kennedy, of Glenopp, Ayrshire, in April, 1862, for 20 gs. He was by Old Donald, a ram my property, out of a nice ewe, in the Captain's flock.

"The Ayrshire Laddie," as the prize shearing is called, gained the first prize in his class, at the Ayrshire Agricultural Association's Show, held in Ayr, in April, 1862, as also the first prize at the Battersea Royal, the first prize at the Union Show, held in Dumfries in October, 1862, and the first prize at the Nithsdale Agricultural Society, at Thornhill, in 1863. He is now withdrawn from the show-yard, being a very good breeder.

The blackfaces are a very hardy breed of sheep,

living where the Cheviot cannot. The wool is coarse, although it is now giving 26s. per stone of 24lbs.; while the mutton is uncommonly fine. These are, no question, a very valuable upland breed of sheep, and I think the pretty general opinion is, that they would pay better than Cheviots in many districts, as you can keep more of them than any other. The lambs have been selling well, *wedder* lambs from 10s. to 14s. 6d., *ewe* lambs from 12s. to 18s., aged *wedders* from 26s. to 34s., aged *ewes* from 16s. to 22s. There are the fair prices of last year, neither the highest nor the lowest. The breed is chiefly confined to Argyle and Perthshire, although scattered in tens of thousands throughout Scotland and the North of England.

Yours truly,
Barr Sanguar, Dumfries-shire, March 2. JAS. DRIFE.



The Centaur.

A superb specimen of a horse bred at the famous stud of the Duke of Devonshire, and the property of the Duke of Devonshire, who has purchased him for the purpose of breeding from him. He was bred at the stud of the Duke of Devonshire, and was the property of the Duke of Devonshire, who has purchased him for the purpose of breeding from him.

DAME NATURE'S TOP-DRESSINGS.

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

In very early times mankind had a suspicion that Nature renovated in some mysterious way the husbandman's exhausted soils. Traces of such dreams are found even in holy writ (*Psalms* lxx. 10, *Isaiah* lv. 10, *Job* xxxviii. 22). Then it was in after-ages suspected by the alchemists that the rain and the snow-water brought down saltpetre. In some of their long-continued and unmeaning distillations of rain-water in a glass vessel, as the water dissolved the soda of the glass, and so setting the silica of the glass free, caused a fine silicious deposit at the bottom of the vessel, it was next sagely concluded that it was *the water* that was converted into silica! It was from these, and other equally inaccurate investigations, that Van Helmont, a celebrated Dutch chemist, arrived at the false conclusion that pure water, and water only, is the food of plants.

When, however, Boyle, and other chemical philosophers, had shown the inaccuracy of these experiments, and Cavendish had discovered the real composition of water, other erroneous conclusions were adopted. It was considered that when rain-water is carefully collected, that it is water in a state of purity. All modern examinations, however, lead us to very different results. Various foreign substances have been of late detected in the moisture of our atmosphere. These, it is true, exist in only very small proportions, but still in amounts that there is little doubt exert a very considerable influence upon the soils we cultivate, and the plants they produce.

An examination of these foreign matters, some of which are merely mechanically suspended in the atmosphere, whilst others are chemically combined with its aqueous vapour, and shower their fatness over our soils in rain, in snow, and in dew, may usefully refresh our memories. It may also serve to remind us of at least one cause of the advantages of deep stirrings of the soil, and of other agricultural practices not yet generally adopted. By thus trying to understand the chemistry of these things, we avoid following the sage example of our ancestors, who were used to crop their land till its productive powers ceased, and then they left that soil for years, to grow what nature pleased. Then, as they found that at length the soil again acquired a certain degree of productiveness, they very gravely explained that fact, as they did in the case of their exhausted plough horses, viz., that it was owing to the land needing "rest!"

What, then, are the top-dressings with which Nature fertilizes our soils? what are the mechanically-suspended matters of the atmosphere? We are all aware, that in the vicinity of towns, and other populated places, a fine powder is constantly falling; this is not only composed of the soot, but of the finely-divided earthy matters of the coal and other fuel employed. This forms one very considerable source of the mud of the London streets; but the deposit of these matters is not confined to the town, or its immediate neighbourhood; they are dispersed for many miles. They are detected in the rain gauges of Rothamsted, twenty miles from London, when the wind blows from the metropolis towards that place. It may be regarded indeed as a fact that the air is never free from particles of dust, and these, according to the observations of Professor Smyth, extend to a height, according to the season of the year, of from 3,000, to 6,000 feet above the earth's surface (*Jenny's Meteorology*, p. 224).

The distance to which these finely divided matters are conveyed by currents of air is indeed very remarkable. Some instances have been given by Dr. Maury, in his very interesting work on the "Physical Geography of the Sea." He gives the curious results of Ehrenberg's examination of the fine African dust which is showered down so copiously in that quarter of the world. He tells us that this dust, when subjected to microscopic examination, is found to consist of infusorizæ, and organisms whose *habitat* is not Africa, but South America, especially in the south-east trade-wind region of South America. The Professor examined specimens of sea-dust from the Cape de Verd Islands, as well as from Malta, Genoa, Lyons, and the Tyrol; and he found a similarity between them as striking as it would have been had these specimens been all taken from the same pile. South American forms he recognised as prevailing in them all.

This dust makes its appearance chiefly after the time of the vernal and autumnal equinoxes. It is then that the great valley of the Orinoco and the Amazon are dried up. In spring that of the Orinoco is dry, the flood waters have retired: the surface of the earth, covered with impalpable and feather-like remains of animal and vegetable organisms, is swept over by whirlwinds and gales of great force. At the period of the autumnal equinox, another portion of the great Amazonian basin is parched up, and similar powerful currents of air raise the same clouds of dust, and disperse them across the ocean into other quarters of the earth. The reader must note that we are here speaking of enormous valleys, whose extent was alluded to by a recent traveller as being such that if England and France were placed in that of the Amazon, an explorer might search there for some time without finding them.

And it is not only the dust of the earth that is carried by the winds over the ocean to distant lands: the sea-water is raised, by other breezes, in fine spray, and swept on to the land. It has been detected in sensible quantities in the atmosphere of Holland and in England, many miles from the sea. Common salt in fact is found in minute proportions in almost all soils and all waters, even in that of the most upland springs; and it is pretty certain that this salt can only be supplied to them from the spray of the ocean.

We see then that the mechanically suspended matters of the atmosphere, the soot which abounds in ammoniacal salts, and the saline and other deposits, must not be forgotten when we are considering the top-dressings *not* bestowed by the cultivator.

When we follow the chemist in his valuable inquiries into the minute foreign substances chemically combined with the aqueous portion of our atmosphere, a new class of bodies present themselves: salts and acids make their appearance. As I have in another place observed, M. Barral has given the results of his experiments upon the rain-water collected in the gauges of the Paris Observatory. He determined that the amount of nitrogen annually carried down to the surface by the rain amounts on each acre to 20.84 lb., of which 10.70 are in the state of nitric acid, and 10.14 in that of ammonia. The quantity varies monthly. The following table shows in kilogrammes (a kilogramme is equal to 2½ lb.), I., the month; II., the quantity of nitrogen deposited by the rain per hectare (= 2.471 imperial acres); III., the

nitric acid; IV., the ammonia (*Trans. High. Soc.*, 1854, p. 310):—

L	II. Nitrogen.	III. Nit. Acid.	IV. Ammonia.
July, 1851.....	3.90 ..	5.03 ..	3.15 ..
August,	2.18 ..	4.89 ..	1.04 ..
September,	2.94 ..	8.89 ..	0.77 ..
October,	1.16 ..	2.81 ..	0.53 ..
November,	1.93 ..	4.26 ..	1.01 ..
December,	2.50 ..	5.95 ..	1.17 ..
January, 1852.....	2.127 ..	4.165 ..	1.271 ..
February,	1.841 ..	1.955 ..	1.619 ..
March,	0.937 ..	2.210 ..	0.427 ..
April,	0.838 ..	0.852 ..	0.749 ..
May,	1.664 ..	3.998 ..	0.762 ..
June,	1.889 ..	1.276 ..	1.285 ..

From this table (remarks Dr. Anderson) it appears that the quantity of nitrogen is largest in the summer and autumn months, and smallest during spring, and it is particularly remarkable that in March and April, when vegetation begins to become active, the quantity reaches its minimum. Professor Way (*Jour. Roy. Ag. Soc.*, vol. xiv., p. 379), calculating from the quantity present in the rain which fell at Oxford during October, 1852, makes the quantity of nitrogen to be annually 23.54 lb. per acre as ammonia, and 17.88 lb. as nitric acid. Two French chemists, however, could not detect any nitric acid in the rain of Lyons and Marseilles. Boussingault has determined the quantity of ammonia in rain-water collected at a distance from towns. He found, on an average, only 0.043 grains of ammonia in a gallon of rain-water, or about 1-25 of a grain, being only about *one-seventh* of the quantity found by Barral at Paris. He also found that the amount is not uniform, but is always largest at the beginning of a shower, and diminishes at the end (he has found half a grain per gallon at the commencement of the shower), and what is remarkable, that the water collected during fogs is very rich in ammonia, containing on the average about one-third of a grain, and, on one occasion, *four grains*.

Such are the contents of the rain, and other moisture, which descends on the farmer's fields. The weight of this water varies from an average of about 2,000 tons annually in Essex and Suffolk to 3,600 or 4,400 tons in Lancashire and Westmoreland (an inch depth of rain is about 100 tons per acre). Mr. J. Dickenson, of King's Langley, in Hertfordshire, has given the average depth in inches of rain, the proportion of this which filtered or drained away, and the proportion which evaporated, in the eight years from 1836 to 1848 inclusive (*Jour. Roy. Agri. Soc.*, vol. v., p. 150). It is as follows:

	Rain.	Filt.	Evap.
January.....	1.847 ..	1.307 ..	0.540 ..
February.....	1.971 ..	1.547 ..	0.424 ..
March.....	1.617 ..	1.077 ..	0.540 ..
April.....	1.456 ..	0.806 ..	1.150 ..
May.....	1.856 ..	0.108 ..	1.748 ..
June.....	2.213 ..	0.039 ..	2.174 ..
July.....	2.287 ..	0.042 ..	2.245 ..
August.....	2.427 ..	0.036 ..	2.391 ..
September.....	2.639 ..	0.369 ..	2.270 ..
October.....	2.823 ..	1.400 ..	1.423 ..
November.....	3.837 ..	3.258 ..	0.578 ..
December.....	1.641 ..	1.805 ..	0.154 ..
Mean.....	26.614 ..	11.294 ..	15.320 ..

Rain-water has often its ammonia increased in amount as it percolates through the soil, in the neighbourhood of densely-populated places. Ammonia is found even in snow; in two qualities of snow there were found per gallon, from a terrace near Paris, 0.00178 of a grain; from a garden close by, 0.01034.

Still more recent examinations of M. Barral have led

to the conclusion that phosphoric matters also exist in rain water. He tells us that the proportion of phosphoric acid in the different residues by evaporation of rain-water varied from 2 to 11 per 1,000. That only corresponds to a quantity of phosphoric acid, varying from 0.05 to 0.09 per litre from rain-water. The quantity of phosphoric acid contained in the residue of evaporation from the country waters is much greater for the same weight than in the residue left by rain-water in Paris.

We see, from the preceding results, that the annual addition of phosphoric acid which can be made to arable soil by rain-waters amounts to about 400 grammes per hectare. The researches of M. Boussingault have discovered that a hectolitre of wheat carries from the soil nearly 1 kilogramme of phosphoric acid. We see, then, that in order to obtain in wheat 7 to 8 hectolitres per hectare—that is to say, the ordinary crop of lands cultivated with manure upon the fallow system—it is necessary to let the fields rest nearly twenty years, if the soil contains no trace of phosphates, and if there has been no addition of phosphoric matters from other causes than rain-water (*see ante* p. 165).

But it is not only saline mineral acid and organic matters that descend into our fields from the atmosphere; the minute germs of vegetable and animal life are ever floating in it, and descending around us. It was in a recent number of a valuable periodical (*Good Words*, vol. for 1864, p. 169), that Sir David Brewster, when ably tracing the "Life in a drop of water," has given a detail well worthy of my reader's careful study. It is towards the conclusion of his paper that he remarks upon the recent discoveries of M. Pasteur. This distinguished French chemist has shown that the animalcules of the family of Vibrionæ have the property of determining fermentations, and can live and multiply without any contact with the atmosphere; that one variety of these minute animalcules produces the butyric fermentation; another animalcule determines the fermentation of tartrate of lime. Then again there are endless minute germs of vegetable life swarming in our atmosphere. These are the minute bodies which have puzzled so many inquirers from the days of the Greek republics even to our own time—men who, unable to explain the phenomena they encountered, gravely assigned to "spontaneous generation" what they had not the power to understand. And, as Sir David Brewster adds, "when an aqueous solution, deprived by boiling of any life it might contain, is found after a few days' exposure to the air to be swarming with animalcules, it is not unreasonable to suppose that they were *spontaneously generated*, or, what is the same thing, that they had no parents, and were formed out of the organic matter in which they were found. From the time of Aristotle, who believed in the spontaneous generation of larger animals, the subject has been one of angry controversy among naturalists. The men who, in modern times, have formed suns and planets and systems without the direct agency of a Creator, were eager to ascribe the origin of life to electrical or chemical agents, and to derive from a primitive monad—an atom of gelatine—the noblest forms of animal and intellectual life. Their opinions found an apparent sanction in the birth and multiplication of the infusorise, and men without faith willingly yielded to the delusion. But when science advanced, and the microscope put on its high powers of research, the doctrine of spontaneous generation met with formidable opponents; and when, a few years ago, it forced itself into notice by its connections with speculations equally extravagant, the French Academy of Science offered the Alhambert prize for 1862 for "the best experiments to throw a light on the question of generation called spontaneous." Many valuable memoirs were sent to the Academy, but

the prize was *unanimously* adjudged to M. Pasteur, now a member of the Institute, for his memoir "On the organised corpuscles which exist in the atmosphere," in which he refutes the theory of spontaneous generation, called *heterogenie* by its supporters, and establishes that of *panspermia*, or *seeds everywhere*, the name given to the opposite truth. In this unanimous decision the most distinguished naturalists of France have pronounced the doom of a dangerous speculation which had long baffled the ingenuity of the ablest inquirers.

"That the 'life in a drop of water' is produced by living germs existing in the atmosphere has been placed beyond a doubt by the researches of M. Pasteur. He has shown that organised corpuscles are suspended in the ordinary air which we breathe, and that these corpuscles produce the life which we have been studying in a drop of water. In order to corroborate this important truth, he undertook to prove that animalcules were not produced by air entirely free from the germs which existed in the air around us; and for this purpose he carried *twenty* glass receivers to the foot of the Jura mountains, other *twenty* to the top of one of its highest peaks, and other *twenty* to the glacier of Montanvert, and filled them with the pure air of these elevated localities. Out of these *sixty* glass vessels only *fourteen* produced animalcules, when a suitable infusion was ex-

posed to the action of the air which they contained—the other *forty-six* producing no infusoria in the same fluid."

These experiments proved that pure air from the Glaciers and from Jura was unable to generate animalcules in a suitable infusion, and placed it beyond a doubt that infusorial life like all other life is produced from parental germs existing in the lower and even in the upper atmosphere.

We see then how very undesirable it is that we should believe in those who are so ready to *explain* unknown facts by unmeaning verbiage. It is only by patient examination and a steady regard to fact, that we can hope to attain any valuable information with regard to the soil we cultivate, and the yet little-known marvels which occur, before (to give only one instance) a grain of barley germinates, a grain of malt is produced, or a glass of beer placed on our table. Let us then be assured that much yet remains to be accomplished, many a particle of light vouchsafed to the patient humble searcher after truth. But then let us—as well we may—be ever content with noting the phenomena we encounter, the mysteries of animal and vegetable life we discern, without troubling ourselves with utterly fruitless dreams as to their origin. For of that, let the reader be well assured, the most profound philosophers have not even the slightest conception.

SALE OF THE TOWNELEY SHORTHORNS.

Strangers and natives concur in describing Burnley and the parts adjacent as a veritable "vale of tears," all the year round. Mr. Jorrocks, that great "muck's your man" beacon to the farmers, would have observed that he was "salivated by the wet;" and profiting by our previous experience, we dare not have obeyed Mr. Strafford's "call of the house" without an undeniable dreadnought in reserve. "The Drum" has been certainly a symbol of fair and not of foul weather at Towneley; but be that as it may, Culshaw, amid his other avocations, had made quite an Admiral Fitzroy of himself for some time previous to the sale, and derived much solid comfort from the deluge on Sunday and Monday. Wednesday was clear and keen, and the sun went down for the last time on the first Towneley herd with calm promise for the morrow. Knuckles were busy on the weather glasses, from an early hour on Thursday, and the advance of six degrees to the good during the night in the one we noted, had its set off in a slight fall of snow during breakfast; but twelve o'clock came and departed without any more bad symptoms, and an afternoon loomed at last well befitting The Butterfly's Ball.

Such a host of visitors had been filtered through the byres during the last few weeks, that the Wednesday's levée was not very large. Many thought the chances of a bed in Burnley too problematical on such an eventful eve, and bivouacked at Leeds, Manchester, Blackburn, Accrington, &c., or sought those Horses, Bulls, and Lions—Black, Red, and White—which are so rife in the Yorkshire and Lancashire valleys. Lady Pigot and some of the party at the hall, (which included Captain and Mrs. Gunter, Mr. Macintosh, Mr. Torr, Mr. Clark Irving, and Mr. C. P. Gell, &c.) attended Culshaw's "at home." This entertainment was more quaint than usual, when the points of Perfume were under review, and her ladyship "dallied with her golden chain, and smiling put the question by," when her guide suddenly paused and thirsted for information in the presence of Roan Knight's Butterfly and Royal Butterfly's Duchess, as to why two Royal cheques should have been recently sent to Colonel Towneley with the names of Lady Pigot and Mr.

Richard Booth erased. Lapse or no lapse, let us hope that Branches, Warlaby, Towneley, and Thorneyholme may still be fated to meet as of yore in many a quadrilateral duel. Perfume was pretty generally assigned to John Ward's future care, and it was strongly surmised that Mr. Eastwood, (whom no cheanut-haired Butterfly has ever been able to wean from his earliest love, and the Towneley herd which he founded,) would make it very hot for any one who wanted either Barmpton Butterfly or Royal Butterfly's Pageant. It was assumed, as a matter of course, that the average must be above £90; and more than one wary calculator told Colonel Towneley that he would gladly guarantee £100 for the chance of all they would make over that sum. As far as we could poll public opinion, it stood at "about £100 bar Royal Butterfly." Mr. Strafford was as dark as a turf seer when he was called upon to name; but we believe that although he dare not hope to trump his Lord Ducie card, his calculation was higher than the public's. And this he did foretell that the average would be made up, not by one or two tremendous spurts, but by fair steady running almost from end to end. He had no commission in his pocket from the antipodes, which hold Master Butterfly's bones. No French or Austrian dialogues were heard in the bull boxes on the merits of roast and boiling parts. No snug American Caneus, mindful of Tortworth and '53, sat with closed doors at Burnley to plan another "almighty dollar" attack. In fact, as the late Baron Platt would have said, the average was a "truly British" one.

It was high Change in the yard soon after eleven o'clock; and if some high class English breeders were only represented by proxy, we never saw a more serried phalanx from over the Border. "Jamie Douglas" came not to buy, but out of respect to the memory of Ringlet; Mr. Cruikshank, who has just exchanged Windsor Augustus for a season with Lord Zetland's Sir James the Rose, was trying to satisfy himself if there is a better bull at this moment than Forth; Mr. Young was on the look out for Forth's successor at Keir; and Mr. Campbell (whose highest bull-calf lot last month was Young Diph-

thong, 101 ga.) for something to meet Forth in the Aberdeen Challenge Cup, which he has twice won with Sittyton blood. Lord Strathallan's agent Mr. Thompson was on the Towneley track once more; "Alloa" was faithful as ever to a Booth; and Mr. Barclay was at the extreme right of the auctioneer's platform, not bidding, but looking out as a connoisseur for "a really perfect shorthorn" (if there be such a thing calved), and taking counsel with his bailiff, Mr. Easton, who was full as ever of terse apothegms and as marked in his attentions to "prima donnas." It was rumoured that Mr. Macintosh intended to try and replace his lost Castianira, and he was well touted as he took so many fond looks into two or three boxes; but he had really just purchased the red Fourth Grand Duke, a grandson of Grand Duchess 2nd, and a great favourite of Mr. Bolden's, from Mr. Hegan, which may have accounted for the edge being taken off him when he reached the ring side. Mr. Ather-ton was also there, and busy in a negotiation with Lady Pigot for two more of his beloved Cherries; and Mr. Robinson's story of the *post mortem* of Second Duke of Thorndale, was one of startling interest, to which a death by hair-balls is as nothing. The bull seems to have made a sort of a Ramo Sameo of himself on the voyage from America three years ago, and to have swallowed a bag of nails. He had got plenty of calves, and there are no less than 20 of them in the Clifton Pastures Catalogue, but he had never been thoroughly well since, and on examination the causes of the mischief were found—some of them quite sharp and polished by the gastric acids, and fairly piercing his bowels.

It is calculated that nearly 8000 people were present. Messrs. Atkinson, Woodward, and Barber showed up, as staunch supporters of the Towneley blood; Sir Charles Tempest and the Hon. George Lascelles came, but they were not to be tempted; the two friends from Norfolk also steered their hearts; Mr. Noakes allowed Mr. Freeman to have all the "Kentish fire" to himself; and Mr. J. G. Wood, of Clarinet fame, was the silent "member for all Ireland." Mr. Dodds only looked on, and thought of the firsts he would have scored with Grand Turk and Prince Talleyrand, if the "Brothers Butterfly" had not stopped the way; Mr. Knowles, of course, held "a watching brief" for the Duke of Wharfedale, and Mr. Thomas Booth for the Jeweller blood; while Mr. Fisher, as spruce as a bridegroom, had deserted his Silver Beards and Golden Dreams for a season, and received some very legitimate chaff on his taste for "*The Happy Link*." There, too, was Simmy Templeman, scanning Rose of Lancashire as respectfully as if she had been a first favourite for the Oaks; and the great Ex-Chief Justice of the leash was cogitating over Royal Butterfly's Pageant, as to whether his favourite Indian corn had a share in those plump proportions. There was a strong sprinkling also of the small dairy farmers from the hills, with their unmistakable hats, and of course one hand in their pockets; and the fame of Barmpton Rose had spread far beyond Skipton and Settle, even to the quiet "grey coats" who till the Vales of Grasmere and Langdale, or tend their sheep on the slopes of Helvellyn.

The beautiful condition of the cattle, under the fostering care of the John Scott of shorthorn trainers, created the greatest pleasure and surprise; and even those who, with very good reason, distrust the "racing shorthorns" and their breeding powers, were fain, after a turn "through the nurseries," to believe the testimony of their own eyes, that thick flesh and fertility can exist together. The Second Duke of Wharfedale, by whom 12 out of 27 cows and heifers had been served, was brought out by Crane on to parade for a considerable time in his sheets (in consequence of having been recently amiss), and he was followed about with all the respect due to his lineage, his handle, and the high mark which the First Duke, his half-brother, had put

upon his calves. Then came a general review of the lots in the sale meadow—a ceremony which was rather too brief. In fact, they only walked up the hill, stood there for a few minutes, and then walked down again. We had hoped to have seen a procession of the tribes, Mantalina, Pearly, Vestris 3rd, Roan Duchess 2nd, Barmpton Rose, and Alice 2nd, with "Joe's white hat," dear to *Punch*, and Royal Butterfly at the head of them, as was the ample white waistcoat of Mr. Wetherell on the famous Aldborough day.

The noise of hammers closing the ring rivets, and of choppers chopping salad up in the commissariat department near the granary, had hardly ceased, when Colonel Towneley, who was accompanied by several clerical friends from Stonyhurst and elsewhere, led the van of the first 80 into lunch a few minutes after twelve. The lover of shorthorns did not care for the laurels and banners on beam and wall, but thought of the far more enduring trophies over the chair. There stood two silver challenge cups, the Royal Dublin and the Porcell, near "the bull, cow, and offspring" picture of Frederick, Butterfly, and Royal Butterfly; and there, too, were the heads of that illustrious pair looking down, with set and glassy eyes on the stirring scene which *they* had called into life. The whole of the very excellent lunch (which had 14 or 15 varieties in its bill of fare) was cooked at the hall, by Mr. Palanque, and a strong special staff from London; Mr. Eastwood and Culshaw never wearied of dispensing the yellow tickets; and many hundreds sat down at that bountiful board. The Indian-file nature of the approach created a pretty animated squeeze—I never did see "such a gitting up stairs;" but patience and Mr. Robson's generalship soon surmounted that little difficulty. With so many hungry place-expectants outside, and fifty-eight lots in the catalogue, there was not much time to linger. The Colonel was received with a heartiness, when he rose to speak, which veterans learned in the Yorkshire and Lancashire "Hoorah," declared they had scarcely ever heard before; but still he was staunch to his purpose of not dwelling. He simply gave the health of her Majesty and the Royal Family; and when that was drunk with all the honour, "he had an agreeable and a disagreeable duty to discharge—the one is to thank all my friends for coming so far to do honour to Booth, Bates, and Barmpton Rose; and the other is to ask you to remember the good old saying, 'Live and let live,' and those who are waiting below."

This neat closer had its effect, and a very few minutes after half-past one the beautiful ruins of the twelve-year-old Roan Duchess 2nd were in the ring, and Mr. Strafford ready to dispose of them. The ring, which was pitched for convenience, not in the park, but in the field, near the boxes, was a very large one, and laid down with tan, and two small covered stands were erected, one for Colonel Towneley, Lord and Lady Norreys, and the house party, and the other for the auctioneer. The crowd gradually took possession of the first, under a misapprehension, and gracefully beckoned up their friends, who knew better, and watched mischievously for the end. It was simply this, that they had all to evacuate the place, and a shorthorn janitor was put in command by the Colonel. The heavy artillery, with the exception of that from Penrhyn, seemed to be planted on Mr. Strafford's side of the ring, and we do not exactly remember where the Whitworth gun was laid, when its victorious boom was heard for Tenth Royal Butterfly. Mr. Freeman, whose practice was very fine, took up his position at Mr. Strafford's back, close by Mr. Pawlett's agent, and the Scottish brigade stood in a body in the corner to his right. The ring presented a rather uneven aspect, as in some places the crowd seemed packed in tiers, and in others they merely occupied the ground line. Some tried to scale the top of the visitors' stand, but we

need hardly say that they were speedily routed. The whole ceremony was witnessed with the deepest attention; but it was not so much of a family party affair as usual, and those who could pronounce the pure shorthorn shibboleth were in such a very decided minority that the technical chaff all round the ring was not nearly so good as we have known it. Mr. Eastwood was master of the ceremonies, with Culshaw as general and medical referee, and, as might have been expected, a good deal of "Box and Cox" dialogue went on between the latter and Mr. Strafford over most of the lots.

Mr. Strafford said a few words at opening about the "unique herd," to which he has brought so many customers in its day; and when a distant "waggoner" had exhorted him to "speak up," and he had countered him with "They'll soon speak up for themselves," he dwelt upon Mr. Eastwood's intention to bid for no more than four lots, and strictly on his own account, for the Thorneyholme herd. He then put it to the meeting (at Mr. Eastwood's special request) whether that gentleman should bid or not, and it was of course passed *nem. con.* "I knew it would," continued Mr. Strafford, warming with his subject; "but these newspapers might go and say such things;" and there was a good laugh at the expense of the fourth estate, one of whom mentally "moved that the words be taken down," and took them down in shorthand accordingly. For our part, we warn Mr. S. against insensibly drifting into the Calcraft heresy—"There don't ought to be no newspapers; I'd have 'em all put down by law. Him reprovied, and I know nothing of it! &c., &c."

But we must pass to the winner of 17 firsts, and one or two Irish challenge cups, and tell how our critic offered 500gs. for her in vain, after the Chelmsford Royal in '58. Mr. Wetherell, who occupied a special chair on the platform, remembered how her dam was sold for 80gs. at his Kirkbridge sale, and it was no small feather in his cap that nine of her descendants should have averaged £179 11s. this day! "Nestor" could also have proudly told how Barmpton Rose was Lot 5 on that day, and calved Buttercup three weeks after he sold her to Mr. Watson; and how he, too, had bred Bessy from her, and sold her to Mr. Eastwood. Years had still spared much nice character to that ancient belle, Vestris 3rd; but there was no bidding to speak of, till it was the turn for another "woman in white," Pride of the Pearly Tribe, with only one cross lacking in Valiant to make up a pure Booth. Mr. Pawlett's agent marked her for his own, and let us hope that a Baron Hopewell calf from her will solace him for the loss of Isabella Rose's. As it was, he saved at least 10gs., seeing there was a bid of 140gs., just too late.

The Earl of Derby's agent bought another of the same tribe at 50gs.; then came Young Barmpton Rose, and well might Culshaw say that "she's a rare breeder," and be surprised when 71gs. was the only response. Alice Butterfly, the only Master Butterfly there, and the dam of Double Butterfly, was a very squarey red cow; and she went for 100gs. to Huntingdon. The shade of Bracelet was, of course, duly invoked on behalf of Pearl, and at that war-note Mr. Mitchell was all alive; but a Pawlett commission takes a vast of beating. There were two bids of 80 for Violante very soon, and five more secured her for Lord Strathallan. "Her udder's a little sore, but she's the dam of a plum," was the terse comment on old Pageant, and down went Mr. Betts's name in the natty Thornton register, which averaged about 74gs. for the first ten. There was a declaration of doubtful about Frederick's Ringdove, and a recommendation to give her some exercise; and then Mr. Parker, a Cumberland "colt," came out, and bore off his maiden plate, in the shape of Butterfly's Hope, rather a nice cow, with biggish hips, but a still bigger girth, to the pleasant banks of the Eden. We don't know whether it was a good omen or not, that she was entered to Sir Tatton Sykes, whose agent (Mr. Parker) was below, on the look-out, it was said, for a bull; but "mutual explanations followed, and harmony was restored." The sun shone right out, to the great joy of the photographers (who had been levelling their lenses at the lots in the yard and the

crowd round the ring with the greatest energy) just as Rose of Lancashire was ushered in. She is such a deep, beautiful cow, that Mr. Clark Irving could restrain himself no longer; but he was not in his Drawing Room Rose form, and Crisp, of cherry-red chesnut and Suffolk pig fame, carried her off at 180gs., to make havoc in some local rings. Precious Stone was another doubtful, but still there was the Bracelet strain, and in went Mr. Mitchell; but so cannily, that he wouldn't say 44, and a Whitehaven gentleman holds the once promising white, and her Baron Hopewell prospects, which date from Dec. 27th. There was a great deal of sweetness about the roan, Frederick's Pride, and as she raised her true shorthorn head towards Mr. Drewry, she seemed to whisper "Holker," and he couldn't resist her and her Royal Butterfly prospects. White Butterfly was a gay, upstanding sort of cow, but a little wanting in her loins, and there was fresh activity on Mr. Strafford's right. Mr. Cruikshank (who dearly likes to take something home, go where he may) went up to 60gs. for her, and Mr. Parker was in once or twice after that, but Mr. Packe's agent stayed longest. Young Butterfly was the first Royal Butterfly of the day, with grand hair, and fine form and shoulders; but there were traces of a recent blister, which, although it was not in the place to excite lung suspicions, helped to shake off Mr. Crisp's opponent at 125gs. La Fille de Frederick, with her two Frederick crosses, was another of the doubtful trio. She is a handsome cow, and Mr. Mitchell had a strong fancy for her; but though his friend "Jamie" egged him on might and main, he failed to get him past 60gs. *Fifty* was the first bid for Roan Knight's Butterfly, the first prize in-calf heifer at Worcester; but "No! No!" was the very natural and virtuous response. *Seventy*. "What d'ye mean?" Anon there came 120 from Mr. Clark Irving, "The exchange is against Brother Jonathan. I want him here to teach you how to bid—you've forgotten the way." 155—"I'm ashamed." 170—"She's as cheap as old rags"—and *five*—but no more could be squeezed out, and this thick and good cow became the Duke of Sutherland's.

Butterfly's Ringlet was not well, and had to be passed; but Mr. Mitchell said 81 this time, for Pearled, fast enough. Royal Butterfly's Duchess was worthy of the union of the two greatest winners in the herd, and has mellowed, since July, into a remarkably grand "prizefighting cow." As a calf she struck us as the living *fac simile* of her father, on a scale for inches; and her huggins and loins are so beautifully covered, that Mr. Strafford might well say—"She'll be one of the pictures in my book." "Ninety," said Captain Oliver, breaking the silence for the first time, to our knowledge, but he stopped at 180; and as Mr. Betts and Colonel Pennant's agents fought it out by tens and twenties, up to 490, the face of Culshaw, which had worn a most blighted expression up to this point—despite Mr. Strafford's assurance that "the young-'uns will set you all going"—quite lighted up at last. "Four hundred and ten," said Mr. Smith, "that's Bates"—450—"they blow me up about liking Bates." 490—500. "Come along!" but Mr. Smith shook his head, and would have no more of it.

It was now three o'clock, and only 20 lots sold, and an average of 101gs., with 9gs. to the good. Roan Knight's Pride and Buttercup Again, did not help matters on; the former had nice long quarters and good loins, and looked a breeder; but the latter was quite out of bloom. Nothing walked more proudly round the ring than Frederick's Farewell, with her grand depth of rib and forequarter, of which she gave such promise, as, at 104. 17 *mis. p.m.*, on that October night when Culshaw "lent his soft, obstetric hand," we noticed this rich roan heroine of nine firsts "blowing her nose in the straw." Beautiful as she is, her calf was not much liked for colour or anything else, and this told against her, and Mr. Clark Irving did not persevere. Every ring movement of Culshaw's was, of course, very keenly scanned, and when, abandoning his previous reserve, he patted the head of Barmpton Butterfly, it looked very ominous of a rally. Flesh, hair, and fore-quarter were all there, and Mr. Eastwood came up under the rostrum to give battle for this grand combination of Royal Butterfly and his favourite Dick. The fight was short and decisive. "It's against you at 300, Mr. Eastwood;" and *ten*—"against you again"—and *fifty*—and Thorneyholme was her destiny. Mr. Young was in nearly

as good tune when Another Roan Duchess was announced, with perhaps the wealthiest look of anything there. Mr. Young didn't care to appear very keen, so she hung a little at 125gs., and Mr. Stafford declared her, by way of encouragement, to be descended (so we understood him) from the cow which stands at the corner of Durham Cathedral, whatever that might be. This piece of ecclesiastical information was worth another hundred—"and five" was Mr. Young's rejoinder to every glance round, and once in with his hare, like Hughie Graham, he "fairly smothered it," and couldn't be got out again. His neighbour's prowess stirred up Mr. Craikshank for Butterfly's Pride, a neat heifer, but a little gaudy behind; and "have patience for a few months," was the best parting advice for Mr. Dugdale, when he bought Burnley Butterfly, who was very weak after a severe calving. Double Butterfly, a fine wealthy roan, rather lame from the effect of gravel in one foot—then went to Thorneyholme at 300; and Perfume, which, although her top is not so level as it might be, impressed many quite as much as anything there, was secured very cheap, owing to the ominous double blank in the service list, at only 190 guineas, for Branches, for which Mr. C. P. Gell acted as commissioner. Red Duchess might have been better at the tail head, but she has a capital well-sprung middle with very nice bone, and so thought Lord Sudeley's agent. The colour of Royal Butterfly's Pageant looks less staring than it did when she was a calf, and Mr. Macintosh's Lady Oxford 5th and Capt. Oliver's Lalage 2nd were before her at Worcester. She has kept her nice rectangular proportions well, along with her hair and quality, and proved the champion price lot of the day. She was put in at 200gs., and in an instant Mr. Eastwood covered Mr. Freeman, and had the 350, 400, and the 500. Then came such a rattling cheer all round the ring, and Joe dodged about near his red and white darling, and rubbed his hands, with a noiseless chuckle. Then their firing grew slower; Mr. Eastwood's measured "and ten" fairly wore his opponent out. "Will you have any more, Mr. Betts? Did you speak?" "No?" "And the glass runs, and your last chance with it," at 500. And so three Royal Butterflies from Young Barmpton Rose, Alice Butterfly, and Pageant, are bound for Thorneyholme, at an average of 418 guineas. We call that backing a bull against the world. Stimulated by the dashing example of his seniors, Mr. Parker was soon on at 85 for Violante's Butterfly, who eventually went to Penrhyn. Venus's Butterfly has only been shown twice, but she has won both times; her rump end is not quite right, but, really, when you look over Beautiful Butterfly, the slightest perceptible plainness on that part, and an equally slight tendency not to be so thick through the heart, as some of them, are the mere specks on a most lovely heifer. There would have been more than 150gs. bid for her, but, alas! she was born six weeks before her time, on May 29th; and thus a most promising Royal candidate is disqualified. Two were in for her at 105, a busy but a distant voice said 145, and Mr. Freeman covered him; then it came with another five, but it was just too late. It was now four o'clock, and the average within an ace of 133gs. There were still 22 lots to sell, and Mr. Stafford warned his audience, who were certainly rather sluggish, of their prospect of finishing by moonlight.

Then we got fairly into Wharfedale, and had only a middling lot to begin with. Wharfedale's Butterfly, the calf which Roan Knight's Butterfly had about ten days before she went to Worcester, was a very neat one, and like all the rest with nice heads, and in fact, take the herd throughout, it was quite a study of heads. Mr. Parker fought her up to 85, and then Mr. Pecke was left alone in his glory. When Butterfly's White Duchess came out, those not previously in the secret began to see why her dam, Royal Butterfly's Duchess, served by the same bull again on Nov. 16th, had made such a figure. "She handles like a lady's muff," said Culshaw, drawing his hand daintily over the little 6½-months white. Captain Oliver needed no telling on that point, and was not shaken off before 160; but Mr. Freeman (for Mr. Betts) would not separate mother and daughter, and went in boldly up to the finish, which was 170.

And here we must observe that, if ever the national post of "judicious bottle holder" becomes vacant, Mr. Baxter of Elelack is just the man to fill it. He was bristling all over with bottles. The neck of one protruded from each great-

coat pocket, he had one in his breast pocket, and a fourth in his hand; and he was ever ready near the platform, furnishing ammunition for the great guns. If they grew slack in firing, he nettled them up; if they were exhausted with their efforts, he encouraged them to load again; so that he had them all ways. In short, he has fairly earned a Butterfly cross of honour. But to proceed. Duchess's Butterfly seemed rather a cheap bargain, and Mr. Roper invested in three more out of the next four, as if tempted by the beef prices, he determined to take time by the forelock and go in for real. People thought it was going to be "Mr. Eastwood again," when Culshaw himself took hold of the halter of Duchess of Towneley. Then came a very grand slight-of-hand scene, as he played with it, and deftly coaxed it to stand up at the mature age of a month and four days, as proudly as if it was in the Royal ring for the ribbons on its own account. It was an immense treat, and certainly we have seen nothing like it, save Rarey at The Round House, or Jem Mason handing one of Elmore's over a fence. This fine rope practice was not lost on Mr. Roper, and after a most amusing guinea for guinea struggle between him and (we think) Mr. Foster of Kilbow, right under the Towneley stand, the infant Duchess became his own for a hundred. Then Culshaw changed his tune, and resigning the rope, he placed his hand on the loins of Duchess of Lancaster, as if he was an anatomical professor, lecturing for the benefit of science in general and Towneley in particular, to rather an extensive class. Phœbus Butterfly, a red with a spot of white on the quarter, was in consideration of its 17 days allowed to run loose, and with it the female lots were ended, and in an instant Mr. Thornton handed round the average of £123 19s. 4d. for the 46.

All Mr. Stafford's assurances that Mr. Booth was getting a 200 gs. hire for bulls not one whit better bred, while here was the fee simple of Baron Hopewell, could not coax Mr. Mitchell fresh as the bull was, quite up to half that sum, and Mr. Waldo stalled him off. Then Royal Butterfly marched into the ring, with the white rosette on his head, preceded by the bandmaster and two musicians of the Fifth Royal Lancashire Militia, who had volunteered their services for the day. With all due respect to that gallant corps, we do not think that melody is its forte, and the duet they performed on cornets, in honour of that bull, made our very blood run cold. He has known many proud days in a ring, where, "after the first five minutes he made everything, save Dickenson's Prince of Prussia, and the mighty Soubadar shrink into nothing by his side;" but it was "the proudest of them all," when five of his stock averaged £449 8s. The world may wax old, and no man ever be able to say what Colonel Towneley can, that at one and the self same time, he had a Royal Butterfly with all his four-year-old bloom in the paddock, and a Kettle Drum at the post. The real "champion of England" (with Messrs. Craikshanks peace be it spoken), stood a few minutes while Mr. Stafford declared that a five-guinea bid over 1,200 gs. would be taken; but although many a man thought that he ought to fill a five-and-twenty or thirty guinea subscription list, after such calves as they had seen that day, there was only a respectful silence. "That's a choker; take him away!" the musicians assailed him in his retreat with "The girl I left behind me," and after that stroke of genius they collapsed. Tenth Royal Butterfly had not long come in from service, and looks a very useful but hardly a show bull now. His nearly fall brother in blood, Eleventh Royal Butterfly, has thickened across the loins, and grown down very much since Worcester, and bids fair to go on into a grand one. His very white roan is rather against him, and he is a trifle light in his neck, a point which takes off from the grandeur of some of the Towneley bulls. Still his immense improvement seems to have struck every one, although we thought him in rather better bloom when we saw him a month ago. Mr. Young was very resolute over him, and a long persevering succession of bids brought him into Forth's deserted box for 400 gs. It seems on the cards that he may be brought out at Newcastle, where Mr. Eastwood will fight the Battle of Worcester over again with his white. Fifteenth Royal Butterfly, (own brother to Double Butterfly), was of undeniable quality and colour, but he was weakish behind the shoulder, and one of his horns was broken, the only disaster of the kind we observed. The Duke of Sutherland got him at 180 gs.

The next lot, Proud Baron, a remarkably level topped bull, but perhaps a trifle narrow, fell to the Duke of Newcastle. The bulls went off slowly, till we reached Seventeenth Royal Butterfly, one of the rarest five-month calves for hair, symmetry, and substance that we have seen for many a day. He looks as if he had been a partaker of what Culshaw modestly calls "a little something to eat," and he has done it full justice. "Three at ninety," were almost Mr. Strafford's first words, and on they went, while Culshaw went and "talked to him," and Mr. Beevor was the happy winner at 200 gs.

Then came the breeder's groan—
"Had it only been a roan!"

as Duke of Towneley, "nearly red," was gently shoved into the crucible, and came out at 55 gs., just 15 gs. less than Mr. Parker gave for the red and white Valiant Duke, who was three months that day. Mr. Eastwood then made his fourth and last effort (and with him bidding means buying) for Duke of the Butterflies, which has piled on 100 gs. at just three guineas a day since its birth on Feb. 12th, and we were at the ending post at last with Prince of Towneley, just a day its junior. Mr. Garne bid most resolutely at first, round the corner of a pillar in the Towneley stand, but the roan was knocked down to a Mr. Fox for 71. There was a dispute, and a reference by Mr. Strafford to those behind him, but the biddings were not reopened; and a little fun, on reply to an enquiry, "as to whether Culshaw was to be put up," closed the fray about twenty minutes past five. Nothing could have gone off better. The squadron of pick-pockets, whose departure was duly telegraphed by the Liverpool police, did not appear, or gathered in no harvest if they did; and the three special trains moved off from Towneley station with a heavy freight, and most commendable regularity. The average for the ten bulls was £149 13s. 7d.; and the results of a day which will be a red letter one as long as Englishmen love a shorthorn, may be summed up in £7,189 7s., or a total average of £126 7s. 7d., thus leaving it a mere question of shillings, thanks to Perfume's caprices, as to whether it stood third or fourth on the beddell roll of sales. On reference back, we find that Robert Collings holds the third place with his average of £128 14s. 10d. for 61, thus winning by 7s. 3d.; while Charles Collings stands Al, thanks to Comet, with £151 5s. 5d. for 47. It must also be remembered with respect to this "nearly a dead heat for third place," that eighteen of the Towneley lots were under a year, and seven born within the year. Colonel Towneley has bought back that ancient matron Roan Duchess 2nd, at a handsome profit to Mr. Reeve, and also tried for two more mementoes, but the new owners would not part. Taking the greater sales in order since Lord Ducie's, they stand thus:

	Lots.	Average.
Lord Ducie's	62	£150 19 11
Mr. Marjoribanks's (1857) ..	59	90 2 4
Mr. Ambler's	50	83 4 0
Mr. H. Combe's	63	80 12 8
Sir Charles Knightley's ..	77	80 1 0
Mr. Tanqueray's	101	77 13 5
Mr. Marjoribanks's	80	74 3 4

The average of the three leading bulls at Towneley was thirteen Royal Butterflies at £252, the same number of Dukes of Wharfedale, of all ages, from July 12th, 1863, to Feb. 29th, 1864, at £60 4s., and seven Baron Hopewells at £115 1s. The six tribes averaged as follows:

1 Mantalina	£105 0
8 Pearly	106 1
5 Vestris 3rd	103 19
9 Second Roan Duchess	179 11
28 Barmpton Rose	121 16
5 Alice 2nd	188 12

The following are the prices:

COWS AND HEIFERS.

(The figures refer to Coates's "Herd Book.")

Roan Duchess 2nd, rich roan, calved September 3, 1852; got by Frederick (11489), dam (Roan Duchess) by Whittington (12299)—Mr. Reeve, 55 gs.
Vestris 3rd, white, calved March 12, 1854; got by Valiant (12253), dam (Venilia) by Tom of Lincoln (8714)—Mr. Beevor, 40 gs.

Pride, white, calved September 29, 1854; got by Valiant (12253), dam (Pearly) by Royal Buck (10750)—Mr. T. E. Pawlett, 135 gs.
Frederick's Bracelet, roan, calved November 22, 1855; got by Frederick (11489), dam (Pearly) by Royal Buck (10750)—Earl of Derby, 50 gs.
Young Barmpton Rose, roan, calved June 21, 1856; got by Richard Cœur-de-Lion (13590), dam (Rosette) by Lord John (11731)—Mr. Naylor, 71 gs.
Alice Butterfly, red, calved August 1, 1856; got by Master Butterfly (13311), dam (Alice 2nd) by Duke of Athol (10150)—Mr. Howe, 100 gs.
Pearl, red, calved November 23, 1856; got by Richard Cœur-de-Lion (13590), dam (Pearly) by Royal Buck (10750)—Mr. T. E. Pawlett, 110 gs.
Violante, red, calved May 20, 1857; got by Valiant (10989), dam (Roan Duchess 2nd) by Frederick (11489)—Lord Strathallan, 85 gs.
Pageant, red and white, calved March 23, 1857; got by Count Gloster (12850), dam (Parade) by Duke of Gloster (11382)—Mr. Betts, 50 gs.
Frederick's Ringdove, white, calved June 21, 1857; got by Frederick (11489), dam (Rosette) by Lord John (11731)—Mr. Greetham, 43 gs.
Butterfly's Hope, white, calved August 19, 1858; got by Baron Hopewell (14184), dam (Paris Butterfly (13311)—Mr. Parker, 45 gs.
Rose of Lancashire, roan, calved July 26, 1858; got by Master Butterfly 4th (14920), dam (Young Barmpton Rose) by Richard Cœur-de-Lion (13590)—Mr. Crisp, 133 gs.
Precious Stone, white, calved February 28, 1858; got by Master Butterfly 4th (14920), dam (Pearly) by Royal Buck (10750)—Mr. Burton, 43 gs.
Frederick's Pride, roan, calved April 14, 1859; got by Frederick (11489), dam (Pride) by Fourth Duke of York (10167)—Duke of Devonshire, 80 gs.
White Butterfly, white, calved June 28, 1859; got by Butterfly's Nephew (15714), dam Paris Butterfly by Master Butterfly (18311)—Mr. Packe, 70 gs.
Young Butterfly, red and white, calved July 19, 1859; got by Royal Butterfly (16862), dam (Young Barmpton Rose) by Richard Cœur-de-Lion (13590)—Mr. Crisp, 125 gs.
La Fille de Frederick, roan, calved December 8, 1859; got by Frederick (11489), dam (Roan Duchess 2nd) by Frederick (11489)—Mr. Platt, 61 gs.
Roan Knight's Butterfly, red and white, calved August 6, 1860; got by Roan Knight (15167), dam (Paris Butterfly) by Master Butterfly (13311)—Duke of Sutherland, 175 gs.
Butterfly's Ringlet, roan, calved January 19, 1861; got by Baron Hopewell (14184), dam (Frederick's Ringdove) by Frederick (11489)—*Ill, not sold.*
Pearled, roan, calved February 23, 1861; got by Broad Back (15696), dam (Pearl) by Richard Cœur-de-Lion (13590)—Mr. Mitchell, 61 gs.
Royal Butterfly's Duchess, rich roan, calved March 1, 1861; got by Royal Butterfly (16862), dam (Roan Duchess) by Frederick (11489)—Mr. Betts, 500 gs.
Roan Knight's Pride, roan, calved March 15, 1861; got by Roan Knight (15167), dam (Pride) by Fourth Duke of York (10167)—Mr. Platt, 71 gs.
Buttercup Again, red, calved July 17, 1861; got by Frederick's Grandson (17881), dam (Rose of Lancashire) by Master Butterfly 4th (14920)—Mr. Colvin, 67 gs.
Frederick's Farewell, rich roan, calved October 9, 1861; got by Frederick (11489), dam (Vestris 3rd) by Valiant (12253)—Mr. Reeve, 150 gs.
Pretty Butterfly, white, calved Nov. 1, 1861; got by Frederick's Grandson (17881), dam (White Butterfly) by Butterfly's Nephew (15714)—Mr. Brierley, 77 gs.
Barmpton Butterfly, rich roan, calved Nov. 7, 1861; got by Royal Butterfly (16862), dam (Young Barmpton Rose) by Richard Cœur-de-Lion (13590)—Mr. Eastwood, 350 gs.
Another Roan Duchess, roan, calved Nov. 20, 1861; got by Master Frederick (18848), dam (Violante) by Valiant (10989)—Mr. Stirling, M.P., 225 gs.
Butterfly's Pride, rich roan, calved Dec. 6, 1861; got by Royal Butterfly (16862), dam (Frederick's Pride) by Frederick (11489)—Mr. Cruikshank, 62 gs.
Burnley Butterfly, roan, calved Jan. 15, 1862; got by Fre-

derick's Grandson (17881), dam (Young Butterfly) by Royal Butterfly (18682)—Mr. Dugdale, 52 gs.

Double Butterfly, roan, calved Jan 21, 1862; got by Royal Butterfly (18682), dam (Alice Butterfly) by Master Butterfly (18311)—Mr. Eastwood, 300 gs.

Perfume, white, calved April 23, 1862; got by Baron Hopewell (14134), dam (Eride) by Valiant (12253)—Lady Pigot, 190 gs.

Red Duchess, red, calved June 5, 1862; got by Baron Hopewell (14134), dam (Roan Duchess 2nd) by Frederick (11489)—Lord Sudeley, 170 gs.

Royal Butterfly's Pageant, red and white, calved August 6, 1862; got by Royal Butterfly (18682), dam (Pageant) by Count Gloster (12650)—Mr. Eastwood, 590 gs.

Violante's Butterfly, red and white, calved Nov. 17, 1862; got by Royal Butterfly (18682), dam (Violante) by Valiant (10989)—Col. Pennant, 205 gs.

Venus's Butterfly, white, calved Nov. 27, 1862; got by Royal Butterfly (18682), dam (Vestris 3rd) by Valiant (12253)—Mr. Platt, 75 gs.

Beautiful Butterfly, roan, calved May 29, 1863; got by Royal Butterfly 10th (18761), dam (Roan Knight's Pride) by Roan Knight (15167)—Mr. Betts, 150 gs.

Wharfdale's Ringlet, white, calved July 12, 1863; got by Duke of Wharfdale (19648), dam (Butterfly's Ringlet) by Baron Hopewell (14134)—Mr. Roper, 43 gs.

Wharfdale's Butterfly, red, calved July 13, 1863; got by Duke of Wharfdale (19648), dam (Roan Knight's Butterfly) by Roan Knight (15167)—Mr. Packs, 86 gs.

Butterfly's White Duchess, white, calved September 30, 1863; got by Duke of Wharfdale (19648), dam (Royal Butterfly's Duchess) by Royal Butterfly (18682)—Mr. Betts, 170 gs.

Baron's Butterfly, roan, calved October 11, 1863; got by Baron Hopewell (14134), dam (White Butterfly) by Butterfly's Nephew (15714)—Mr. Callen, 46 gs.

Alice Wharfdale, roan, calved December 16, 1863; got by Duke of Wharfdale (19648), dam (Alice Butterfly) by Master Butterfly (18311)—Lady Pigot, 80 gs.

Proud Duchess, red, calved December 28, 1863; got by Duke of Wharfdale (19648), dam (Frederick's Pride) by Frederick (11489)—Mr. Frere, 35 gs.

Duchess' Butterfly, white, calved January 21, 1864; got by Duke of Wharfdale (19648), dam (Pretty Butterfly) by Frederick's Grandson (17881)—Mr. Roper, 83 gs.

Wharfdale's Buttercup, roan, calved January 23, 1864; got by Duke of Wharfdale (19648), dam (Buttercup Again) by Frederick's Grandson (17881)—Mr. Roper, 86 gs.

Duchess of Towneley, roan, calved February 13, 1864; got by Duke of Wharfdale (19648), dam (Barrington Butterfly) by Royal Butterfly (18682)—Mr. Roper, 100 gs.

Duchess of Lancaster, red and white, calved February 19, 1864; got by Duke of Wharfdale (19648), dam (Frederick's Farewell) by Frederick (11489)—Capt. Tennant, 29 gs.

Phœbus Butterfly, red, calved February 29, 1864; got by Duke of Wharfdale (19648), dam (Double Butterfly) by Royal Butterfly (18682)—Mr. Roper, 60 gs.

BULLS.

Baron Hopewell (14134), roan, calved August 12, 1856; got by Hopewell (10332), dam (The Baroness) by Baron Warley (7813)—Mr. Waldo, 100 gs.

Royal Butterfly 10th (18761), red and white, calved Oct. 6, 1860; got by Royal Butterfly (18682), dam (Parade) by Duke of Gloster (11882)—Mr. Whitworth, 115 gs.

Royal Butterfly 11th (20719), roan, calved July 4, 1861; got by Royal Butterfly (18682), dam (Pageant) by Count Gloster (12650)—Mr. Stirling, M.P., 400 gs.

Royal Butterfly 15th (20723), roan, calved Dec. 8, 1862; got by Royal Butterfly (18682), dam (Alice Butterfly) by Master Butterfly (18311)—Duke of Sutherland, 160 gs.

Proud Baron, roan, calved April 10, 1863; got by Baron Hopewell (14134), dam (Pride) by Valiant (12253)—Duke of Newcastle, 145 gs.

Royal Butterfly 17th, roan, calved October 13, 1863; got by Royal Butterfly (18682), dam (Vestris 3rd) by Valiant (12253)—Mr. Beeror, 200 gs.

Duke of Towneley, nearly red, calved November 7, 1863; got by Duke of Wharfdale (19648), dam (Young Barrington Rose) by Richard Cœur de Lion (13590)—Mr. Patrick, 65 gs.

Valiant Duke, red and white, calved December 17, 1863; got by Duke of Wharfdale (19648), dam (Violante) by Valiant (10989)—Mr. Parker, 70 gs.

Duke of the Butterflies, roan, calved February 12, 1864; got by Duke of Wharfdale (19648), dam (Burnley Butterfly) by Fred's Grandson (17881)—Mr. Eastwood, 100 gs.

Prince of Towneley, roan, calved February 13, 1864; got by Baron Hopewell (14134), dam (Pearl) by Richard Cœur de Lion (13590)—Mr. Fox, 71 gs.

46 Calves and heifers at £123 19s. 4d.	£5,702 11 0
10 Bulls at £148 18s. 7d.	1,486 16 0

56	Grand total.....	£7,189 7 0
	Average.....	128 7 7½

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY COUNCIL: Wednesday, March 2, 1864.—Present—Lord Feversham, President, in the chair; the Earl of Powis; Lord Chesham; Lord Tredegar; the Hon. Major-General Hood; Sir E. C. Kerrison, Bart., M.P.; Sir A. K. Macdonald, Bart.; Sir Matthew Ridley, Bart., M.P.; Sir Watkin W. Wynn, Bart., M.P.; Mr. Acland; Mr. J. H. Arkwright; Mr. Raymond Barker; Mr. Barthropp; Mr. Bramston, M.P.; Mr. Bowly; Mr. Buller, M.P.; Mr. Cantrell; Colonel Challoner; Mr. Clayden; Mr. Druce; Mr. Exall; Mr. Brandreth Gibbs; Mr. Fisher Hobbs; Mr. Wren Hoskyns; Mr. Hudson; Mr. Hutton; Mr. Jonas; Colonel Kingscote, M.P.; Mr. Milward; Mr. Pain; Mr. Rigden; Mr. Sanday; Mr. Shuttleworth; Mr. Thompson, M.P.; Mr. Torr; Mr. Wells; Mr. Frere; and Dr. Voelcker.

The following new members were elected:—Angus, John, jun., Whitefield, Morpeth. Armstrong, John A., Bays Leap, Wylam, Northumberland. Askew, Watson, Pallinsburn, Coldstream, Northumberland. Barclay, George Robertson, Keavil, Dunfermline, Fifeshire. Barrass, Matthew, sen., Killingworth, Newcastle-on-Tyne. Barrass, Matthew, jun., Killingworth, Newcastle-on-Tyne. Biall, John, Crowhurst, Battle, Sussex. Blandford, Thomas, Corbridge, Northumberland.

Browning, Samuel, Joint Counties Asylum, Abergavenny. Chick, John, Whitwell, York. Clark, James, View Lawn, Longhorsly, Morpeth. Clay, William D., St. Aston House, Lutetworth. Cleasby, R. H., Broomside House, Durham. Cooper, Edward Henry, Markree Castle, Collooney, Sligo. Crawford, Thomas, North Shields. Curtis, Frederick Thos., Elmstone, Sandwich, Kent. Davison, Michael, Long Bank, Alnwick. Dees, James, Whitehaven. Easton, William, 6, Hammet-street, Taunton. Evans, Thomas Sutton, Sawston, Cambridge. Everett, Rev. Charles Henry, Netherton House, Hungerford. Fair, William, Aston-by-Budworth, Northwich, Cheshire. Fawcus, John, South Charlton, Chasthill. Fowler, Edward Parsons, Jersey. Garbutt, William, Dunston Lodge, Gateshead. Glanville, Reginald Carew, Sconner, St. Germans, Cornwall. Grantham, Henry, Scawby, Brigg. Grantham, Richard B., C.E., F.G.S., 7, Great Scotland-yard, London, S.W. Graves, Anthony Elly, Bosbercon Castle, New Boss, Wexford. Hansell, Thomas, North Shields. Harvey, John James, Statenboro' House, Sandwich, Kent. Hill, Henry, Thornton, Pickering, Yorkshire.

Hodgson, Joseph, Blyth, Northumberland.
 Holmden, James, Edenbridge, Kent.
 Johnson, Thomas, Ellington, Morpeth.
 Kingnorth, Alfred, Great Chart, Ashford, Kent.
 Leighton, Robert, Thistlethigh, Morpeth.
 Lethbridge, Charles, Eastbrook House, Taunton.
 Manghan, Robert, Oxford-street, Newcastle-on-Tyne.
 Morton, Henry Thomas, Biddick, Fence Houses.
 Nash, John, Reed-court, Rochester.
 Oakleston, Wm. Fairhurst, Ingon, Stratford-on-Avon.
 Page, Henry, Walmer-court, Walmer.
 Paget, Lewis, Quenibro', Leicester.
 Pattison, J. M., Norwood, Gateshead.
 Potter, Addison, Heaton Hall, Newcastle-on-Tyne.
 Price, James, Eye Cottage, Leominster.
 Radford, William, Beeston, Nottingham.
 Rea, Charles, Doddington, Wooler, Northumberland.
 Stable, Charles Leonard, Crayford, S.E.
 Swann, John, Bedlington, Morpeth.
 Swann, William, Bedlington, Morpeth.
 Taylor, John, jun., Sandycroft Farm, Hawarden, Chester.
 Usher, George M., Railway-street, Beverley.
 Wakefield, W. H., Prizet, Kendal.
 Walker, John L., 71, Oxford-terrace, Hyde-park, London, W.
 Walker, William, Beeston, Nottingham.
 Wellens, John Dodd, Flotterton, Rothbury, Northumberland.
 Webbe, Rev. H. Cowperthwaite, 38, Jermyn-street, London, S.W.
 Wetton, Geo. Norman, Collington, Northampton.
 Wilkinson, Henry Ettridge, Pilgrim-street, Newcastle-on-Tyne.
 Wilson, Thomas, Oaklands, Newcastle-on-Tyne.
 Yates, William, Grindle, Shiffnal.

FINANCES.—The Hon. General Hood, Chairman of the Committee, presented the Report, from which it appeared that the Secretary's receipts during the past month had been examined by the Committee, and by Messrs. Quilter, Ball, and Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on February 29 was £1,709 19s. 10d.

The Committee recommended that the Secretary send the usual circular to members who have not paid their subscriptions for the current year.

JOURNAL.—Mr. Thompson, M.P., Chairman, reported that in consequence of the resolution of the Council giving the Committee authority to take such measures with reference to the illness of the Editor as they considered necessary, a special meeting of the Committee was held on the 5th ult., when a report was received from the physician attending Mr. Frere, which induced the Committee to postpone the publication of the forthcoming number of the Journal from the month of February to the month of March. The Committee had great pleasure in stating further that Mr. Frere yesterday attended a meeting of the Committee, and reported himself convalescent, and able to resume work.

It was announced that on Wednesday, March 16, there would be a discussion on the Cultivation and Management of Clay Farms, to be opened by Mr. Alfred Hughes, of Thorness, Isle of Wight, to commence at 12 o'clock.

CHEMICAL.—The particulars of Chemical Analyses made for Members of the Society during the year 1863 are as follows:—

Guanos	..	...	...	...	40
Superphosphates and similar artificial manures		...	...	...	64
Nitrate of soda and ammoniacal salts		...	...	...	25
Refuse manures	...	...	...	...	29
Bone-dust	...	...	...	...	24
Limestones and marls	...	...	...	...	37
Soils	...	...	...	...	28
Waters	...	...	...	...	10
Oilcakes	...	...	...	...	91
Feeding meals and vegetable productions		...	...	...	10
Examinations for poisons		...	...	...	5

The subjects which have been proposed to Professor Voelcker by the Committee are as follows:—

1. The continuation of the investigations already in hand on the "Causes of Sterility and Fertility in Soils."
2. A series of experiments carried out on soils of different character (light and heavy) on "The influence of SALT in reference to Vegetation."
3. On the Growth of Clover and Grass Seeds, and the comparative nutritive properties of the produce cut at different periods of growth.
4. A series of manurial experiments on Clover.
5. The mechanical and chemical qualities of leaf-mould.

LECTURES.—The first Lecture proposed to be given by Professor Voelcker this year will be on "The Nutrition of Plants from the Atmosphere," to be delivered on the second Wednesday in May, at 12 o'clock. The second Lecture will be on "The Chemical Qualities of Water for Economical purposes," to be delivered on the second Wednesday in June at 12 o'clock.

The Professor wishes it to be stated that he will be in regular attendance at the Society's House, 12, Hanover Square, every Wednesday.

NEWCASTLE MEETING.—Colonel Challoner reported that the Committee recommended that the sum of £200 be granted to the Local Committee to secure the fields marked on the Ordnance plan for the purpose of the trial of steam cultivators in addition to the land which had been offered by the Local Committee. The contractor having laid before the Committee a plan of the showyard, they recommended that it be considered as preliminary, that the exact position of the sheds be subject to adjustment to suit the ground, and that the contractor furnish a final plan in accordance with the above for approval by the Council in April. This report was adopted.

On the motion of Mr. Torr, the Council resolved that Herdwick sheep have the same advantage as to clipping as Blackfaced Mountain sheep.

SHEEP FOR THE VICEROY OF EGYPT.—The Secretary reported that the sheep had been safely embarked on board the Pera, which sailed for Alexandria on the 20th ult., and read a letter from the Lords Commissioners of her Majesty's Treasury requesting their acknowledgments might be conveyed to the Council of the Society for the trouble they had taken in carrying out the wishes of her Majesty's Government as regards the sheep and shepherd for the Viceroy of Egypt.

Mr. ACLAND brought forward the motion, of which Mr. Holland, M.P., who was prevented by indisposition from attending, had given notice, for the appointment of a Committee for the consideration of the measures which ought to be taken "for the improvement of the education of those who depend upon the cultivation of the soil for their support," this being declared by the Charter as the 7th national object to be prosecuted by the Society.

The motion was seconded by Sir Edward Kerrison, M.P., and supported by Mr. Thompson, M.P.; when the Council resolved to nominate a Committee at their next meeting to take this subject into consideration.

The Trinidad Agricultural Society having written to express their wish to enter into correspondence with the Royal Agricultural Society of England, and to request information on the subject of steam cultivation, the Earl of Powis moved that a set of the *Journal* be presented to the Trinidad Society; the motion was seconded by Mr. Jonas and carried.

Letters inviting the authorities of Bath, Bristol, Exeter, Plymouth, and Taunton, to offer sites for holding the meeting of 1865 in that district, were directed to be sent,

The Council then adjourned,

THE MANAGEMENT OF CLAY LANDS FOR THE FEEDING OF SHEEP.

At the weekly meeting of the Council and members of the Royal Agricultural Society, on Wednesday, March 18, Mr. RAYMOND BARKER in the chair, a lecture was delivered by Mr. Alfred Hughes, of Thorness, Isle of Wight, on the above subject. The attendance was very thin, there being at no time, beyond the officials, more than a dozen members present.

Mr. HUGHES said: I should have felt some awkwardness in presenting myself and my scheme before the society, if I were not sure that these meetings are especially intended for the discussion of matters which come within our own experience and observation upon the farm. You will, therefore, pardon any clumsiness which I may display in placing my views before you. I have used the term "scheme," but I beg to say that it is something more than an idea, inasmuch as I have had it in operation for more than two years, and I should not have been here to talk about it now, were I not satisfied, so far as my experience goes, of its usefulness and value. My farm is situated near Cowes, on the north side of the Isle of Wight, and I should think it is composed of some of the stiffest clay in the world. I must preface the observations I am about to make on the management of clay land by laying down one two conditions as to the real character of the soil I propose to deal with. There are all kinds of clay farms, and the class for which I have adapted the rotation which I will presently lay before you is, that which is not adapted to the four-course shift—land that will grow valuable roots, but defies you to make a profitable use of them after they are there, and that is not kind to barley. These two conditions deprive the farmer of such a soil, and of a very large proportion of the kingdom, of two of the most profitable sources of income left to him—the production of a large quantity and useful quality of malting barley, and the production on the farm and on the land itself of a large quantity and good description of mutton. The system of management, therefore, which is set forth in this paper, is intended only for such land as I have described; and those gentlemen whose lot is cast on a kinder soil, not subject to these conditions, will find nothing probably in this scheme which will assist them in their business. My object, therefore, has been to discover a course of cropping adapted to this soil, to relieve it to some extent from the heavy burden and innumerable difficulties which beset its tillage, and to find the means of profitably consuming the greater part of the root crops on the land. I will not dwell longer on the difficulties: they are too well known to all engaged in the management of clay land. We have all seen the long rugged mounds of the cart-wheels in our turnip fields, and the corresponding yellow scars in our barley crop, in the month of June, the result of carting off to the ungrateful bullock at home! We have also seen the thin barley and thinner seeds where stood the puddled fold and unhappy sheep, afterwards the battle-field of Clod and Crosskill. And yet where spring corn is to follow the root crop on land like this, and in a climate like ours, these things must happen; but what worse preparation for our most valuable, most sensitive, and most delicate plant, barley? Then, again: taking wheat after clover on such land, when there has been rain enough to plough the land, that land comes up so tough and stubborn that the wheat can only be cut in by force and buried, or rather hidden in its water-tight drain, by an amount of horse-labour and wear and tear that is looked forward to with dread every year; and if the season is unfavourable, the wheat is not in the land until winter is come. Now, tough wheat likes a firm bottom; the seed of wheat, like all other seeds, does not like to be wedged up in a water-tight compartment, smeared over with the harrow. Wheat likes an early start, and produces, *ceteris paribus*, very much in proportion to the progress it has made in the first quarter of its existence. If our soil, therefore, is naturally tough and binding, we must adopt a mode of preparation for the reception of the seed which will afford as much as possible a kindly seed-bed. Our seed must fall into a condition of soil which will favour a rapid development of root and stem. Again, with regard to our most valuable heavy-land roots—mangel wursel. If they are grown after wheat, even with the most active autumn tillage, the summer fallow for the mangel is so short, that we do not get either the weight or the quality of root which the same land is capable of producing

were it exposed to the influence of a midsummer sun. I will now lay before you a sketch of the system of cultivation which I have adopted for the last two years, in which these drawbacks to our success are met; a system which affords a season and ample time for the profitable consumption on the land by sheep of a very large amount of green crop, thus enabling the heavy-land farmer to participate in the advantage of sheep farming. It renders the farm self-fertilising. The haulage of the root crop home is avoided; and, by growing for the most part roots that will store on the land, and taking no corn crop in the spring, ample time is afforded to consume the root crops with advantage to the sheep and the land. The distribution of the crops, also, is such as to remove the repetition of each course to seven years, and the subdivision of the crops in each course affords an opportunity of removing those that are most sensitive on this point—such as clover, to 14 and 21 years. A great advantage accruing from this arrangement, and saving a great deal of labour, is the time allowed for the preparation of the seed bed for each crop, especially the three with which under the four-course we have the greatest difficulty—wheat, barley, and mangel wursel, the latter getting a summer as well as a winter fallow, thus affording a weather-made surface, and doing away with an immense amount of forcing at seed-time. Now, one of the greatest blunders that we make in farming is, that when we ought to be putting the seed in, and giving it a fair start, we are rending and tearing the surface to pieces by force. By the means I adopt, however, I hope to avoid that; and I think I have succeeded in doing it, by giving each ample time for the preparation of each crop in its course, and to supply a weather-made surface for seed. Another collateral advantage arising out of this septenary division, is the severance of the periods of sowing into smaller tasks, so that none are likely to be protracted in an awkward season (if begun in time), to the detriment of the crop itself and the hindrance of all other work on the farm. The summer preparation for the wheat renders that perhaps the lightest seed-time of the season, affording also the best opportunity for adopting the thin and early sowing so well adapted for a clay soil, and being quickly out of hand, leaves the teams free to push on the autumn tillage, and to run off, while the land is solid, that portion of the root crop destined for consumption on the old lays, pastures, and in the homestead. The old lays remaining unbroken through the wettest portion of the winter afford a firm and healthy run of feeding ground for the sheep when the ploughed lands will not bear them. At some convenient spot near, a good supply of the roots drawn should be securely stored, that they may be supplied to the sheep with as little labour and carting as possible when they are driven from the fold on the turnip land. These old lays coming into fallow for roots, and being firm and clean on the top, will bear the sheep and the carting without damage to the next crop. When driven from these lands by the plough, the sheep must be hurdled off, and fed with the stored roots on a dry pasture till they can take to the turnip land again. I consider this system, and such a provision of green crop, peculiarly adapted to the requirements of a flock of ewes, and to the Dorset ewe in particular, fattening the early lamb and then the ewe—both which may be accomplished on a root crop only. I then bring in a lot of tege to take off the summer folding of tares and rape, feeding with corn or cake. These should be brought in with the intention of selling out the middle of October, they will then have folded over the course intended for wheat. This year mutton selling well, I have kept nearly all wethers through the winter, and have fattened them with very little trouble. The plan I pursue with my sheep is this: having brought in, in September or October, the sheep take the run of the stubbles, and come into fold on the land intended for winter beans or winter oats as long as the weather remains fine. Directly it gets too wet for them there, I move their night-fold to the old station, rye-grass ley, where they find a nice fold of grass and good lodgings. When the stubble seed gets short, I send them to fold on the early white turnips, and having commenced, never lose an opportunity of getting on there, and I would always rather carry out a little litter and bed down a fold or two, than be driven off by the first rain. If wet sets in, we come off to the fold on the ley ground, and supply them from the stack drawn for that purpose, until we can get on the turnip land again. There is plenty of time, there is no corn crop to follow; with a little perseverance the difficulties of the season will be overcome. The

great thing, in this heavy-land folding, is to persevere, but not to persist, recollecting that all the labour and attention bestowed on the sheep is well bestowed, not only on them, but in saving the hauling of the roots home and the dung to the field. I will now take the crops year by year. In the first year I commence with wheat; but we will not now talk of the preparation for wheat, because that will come better when we see what crop precedes wheat. We will, therefore, suppose the wheat stubble to be there, and I find that I can grow a much better quality, and on an average of seasons a much larger quantity of barley on a strictly clay farm upon a wheat stubble than after turnips for any root crop. The difficulty I have referred to in managing the root crop, and consuming or carting it, is such as to stand in the way of one's getting that land into proper condition for barley; whereas after wheat ample time is afforded to get the land into perfect condition for barley. The way we proceed in preparing for the barley crop is this: In harvesting the wheat we leave a six-inch stubble on the land, that is, we cut as high as we can with the scythe consistently with cutting the corn off clean. I do not find it advantageous, however, to turn in the wheat stubble much before Christmas; but I found the land sounder and healthier this winter by leaving it till after Christmas before I ploughed it up, the soil that was turned for the reception of the barley seed being then exposed for a shorter time to the wet. We select a fair time for ploughing before Christmas with three horses. We then break down the top by harrowing once, with two horses, in the first dry time in February. We twice cultivate with a barley cultivator, a light implement that I have had constructed specially for this purpose, which we use instead of the harrow, and which lifts the soil completely up, as deep as it has been ploughed. This requires four horses. My land being in 8 feet ridges, the cultivator, drills, harrows, and other implements are made to take a whole ridge. Having gone once over the ridge, we repeat the dose; but in the second instance we drive the cultivator in the opposite direction. And this is the finest preparation I have yet known for barley upon clay land. The land being in 8 feet ridges, the horses may be kept off it. We twice harrow with heavy harrows before the drill with four horses; drill fourteen rows on 8 feet; three horses light harrow twice after drill; draw up furrows, water furrow, dig corners, and women pick, and clean the land. And taking the entire expense of horse and hand labour from beginning to end of the process, I find the total cost of preparing twenty acres of land for barley to be £18 8s. 6d., or 18s. 8d. the acre. I have facilities for keeping horses which perhaps everybody does not possess. I have some salt marshes close at hand, and a good run for the horses, which cheapens their keep considerably. Well, after barley come beans and peas. For this crop, we cart a good dressing of farmyard dung, sow early, and hoe and weed frequently. I divide this course into three different classes as it were; that is to say, I grow winter beans, spring beans, and an early description of peas. We have not all our eggs in the same basket; and by cutting up the course in this way, we get different periods of sowing; and upon land like mine, one is more likely to drop in for two or three short fine seasons than for one long enough to get over a course of any great number of acres: so we put in one portion of the whole course in winter beans, another portion in spring beans, and the third portion in early peas. The result is this: winter beans; sowing, carting, and spreading sixteen loads per acre, raw dung; ploughing three horses; twice harrow four horses, once two horses, before drill; drill seven rows on 8 feet with double tines, four horses light harrows twice after, furrow plough, water furrow, dig corners, labour picking and clearing round the field. Expenses taken on eight acres £12 0s. 4d., or £1 11s. 3d. per acre. Then we come to the spring beans and pea land. Filling and carting 240 loads to heap; turning, sowing, and carting 176 loads on the land; spreading, ploughing three horses, water-furrow for winter, dig corners, and clear round field; spring work, twice harrow with four horses, once with two horses; use barley cultivator if necessary; drill seven rows as above with four horses, light-harrow twice after, draw furrows, water-furrow, &c. Expenses taken over twelve acres £24 17s. 7d., or £2 1s. 6d. per acre. The next course, that is the fourth year, is oats following upon beans and peas; and with the oats we lay down the land to seed. I dare say you wonder where the seeds are coming from; but I find that I have grown much better seeds after a good standing crop of oats upon my land than I ever did after

barley and folding, and I can get my seeds up with greater regularity and certainty; therefore I seed-down the oat crop for clover. The oat crop again I divide into three parts, namely: a winter portion, getting in some in the autumn in order to make sure of a part of the land in fair time; then black Tartarian oats, a hardy productive description of oat for the spring; and lastly, some Canadian oats. Break and clean well after winter beans, and put Tartarians in in March. Clean well after spring beans and peas. Put winter oats on the spring bean land, and the Canadians on the pea land, and change ground every rotation. Dung for this crop and hoe for seeds. The preparation is this: Winter oats; break up spring bean land with Coleman six horses, crossing with four horses, selecting such points, chisels, or shares as will enter the ground well; twice harrow two horses, roll with pair-horse roll, light harrow, horse rake, picking and clearing land, sowing, carting, and spreading 142 loads per acre farmyard dung raw, plough three horses, twice harrow three horses, drill 12 rows on 8 feet, light harrow twice after, strike furrows, water furrow, cut and clean round field. Expenses taken over eight acres for winter oats £15 10s. 2d., or £1 18s. 9d. per acre. After winter beans and peas for spring oats, we clean, but do not break, the land in autumn; that is to say, we do not find it advantageous to break up the land which is coming in for the spring oats, but rather to let it lie some time before it is prepared for them; though we do break the land which is coming immediately into play for winter oats. The tillage is the same as for spring beans, and the expenses taken on eight acres, which include carting the muck, amount to £12 2s. 9d., or £1 17s. 10d. per acre. We have now got through the four crops of corn, which you perceive follow one after the other, thus: Wheat, barley, beans, peas, and oats. I come next to the first green crop or fifth year. In this grass course I put the tare land which is necessary for the horses at home. Every year I regularly put the land required for tares into the green or seed course, and this is my proceeding: In this course we have clean clover, also trefoil, cow-grass, Dutch clover, and Italian grass, improved Italian ryegrass, and tares required for mowing. Apportion those crops according to the requirements of your business, drill all the seed when you hoe oats between the rows of corn, and top-dress early Italian ryegrass with 3 cwt. of guano, one-half to go on in autumn and one-half in spring. Reserve land for sufficient tares for nag-horses, cart-horses, colts, and cows. Take also what is required to provide spring-feed for the ewes and lambs, and sow with Sutton's improved Italian ryegrass—the most reliable plant I have come across for many years. This will come to the scythe or to feed when the tares are done. Sow what clean clover is expedient, and seed the rest down with a mixture adapted to your soil, and that will make a good sound bottom (this will be the last to break up for roots), two-horse-roll, mix seeds for drill, drill two horses, roll one horse after. Expenses taken on 10 acres £1 8s., or 2s. 9½d. per acre. This is the land I have spoken of before, on which during the wettest part of the winter our sheep will stand; our old cloverleys remaining unbroken till quite the spring of the year, and giving a firm run for the sheep when all the rest of the farm would not bear them. The mixture I sow on land so prepared is composed of trefoil, cowgrass, Dutch clover, and Italian ryegrass, and in all respects it has been the most successful. The way I sow my seeds is this: I horsehoe with Garrett's implement, and drill the small seeds between the rows of corn at the same time that the hoe breaks the surface; thus the weeds die and the seeds begin to live at the same moment. I come now to the sixth course—roots; the roots you see follow the seeds. I reserve for the mangold that land which was in tares, and gentlemen who are acquainted with the practical working of these matters will understand at once the advantage of that. It is, that we cut those tares for the use of the horses, we cart on the manure at once for the mangold, and the land is ploughed immediately; so that we often begin using our tares as early as the month of May. The long muck or dung is carted on and ploughed in with three horses at a great depth, and very often that land is under a summer fallow for mangold in May. I reserve that portion of the land which was not seeded down to clover, trefoil, or Italian ryegrass—viz., that which was in tares—for the early preparation for next year's mangold. And this is the process: Put the mangold on the tare land, dung for them, follow with such roots as store well, and have a fair breadth of early white

turnips: four acres mucked before harvest, 18 loads per acre, long muck; filling, carting, and spreading; mow and cut round field; plough the whole with three horses; water furrows for winter; filling and carting 80 loads dung to heap for remaining four acres; turning ditto back in a dry time; three horses, harrow once; heavy drag, four horses; cultivate with four horses; barley cutter; filling, carting and spreading muck on four acres; roll down, three horses; draw out and plough, two horses; roll, two horses; harrow, two horses, burning and carting earth, mixing, filling, and carting manure to field, one horse; drill, three horses; roll, one horse. Expenses taken on 8 acres £20 7s. 6d., or £2 10s. 11d. per acre. I come now to the second division of the seeded or clover land, that is, the land which is intended for swedes and hardy turnips. Plough as deep as the soil will admit of in March or April. At first I began by ploughing the land up earlier; but I find that by waiting until the water was going down in the spring of the year, my land came quicker for the root crop than if I had turned it sooner, and it had received all the wet of the winter. I also found it healthier; and when pressed for a dry spot for sheep, I had these good, sound, healthy clover leys to go to, where I could run off all the roots without detriment to the land, and with great comfort to the sheep. It is for these reasons then that the ploughing of the clover land is deferred so late. Plough as deep as soil will permit, with three horses, in March or April; harrow twice directly the land will work, and again in a fortnight, or use the *barley cultivator* if it will work without raising the soil, with three horses; put manure on with distributor, and harrow in same line before the drill, with three horses, two horses, and two horses; burning ashes, sifting and mixing manure; carting ashes home and manure to the field with three horses; roll, one horse. Expenses taken on eight acres:—For swedes and hardy turnips, £3 15s. 9d., or £1 2s. the acre. I think you would be surprised to see the clover lands that I have just turned in for roots. Notwithstanding all the wet weather we have had this year, they ploughed remarkably well, and I am much nearer a turnip crop there than I ever was during the ten years that I farmed clays in Suffolk, by ploughing over and over again. I come now to the third division of the ley ground in the preparation for roots; that is, the rye grass land, which was laid down for the ewes and lambs in the spring of the year. I always reserve a portion of the oat land to lay down with improved Italian rye grass. I do not know whether any of you have tried it; but when I tell you that I put it in in the spring, and dressed it after harvest with guano, and that in autumn, when my sheep fed off it, it was up to their knees, and that I feed off it again this spring with ewes and lambs, I think you will agree that this is a crop of very great value on a heavy-land farm. In a short time it will be up again, and we shall be on again with our sheep. This Italian rye grass, which is sold by Sutton, of Reading, is a most astonishingly vigorous plant; indeed, I never saw anything equal to it in the course of all my experiences. We plough up the rye-grass ley the first time in January or February, with three horses; water-furrow: turn back in March with three horses; harrow twice in a place, with heavy drags weighted, four horses, when the land will work. We give it more tillage than any other, because it gets bunched and tough after Italian rye grass, and wants more dealing with than clean clover land. We cultivate across twice with *Coleman*, clod-crush with three horses, harrow with two horses, roll with one horse, women picking docks and grass; plough for crop, two horses: burning earth; sifting and carting earth home, one horse; mixing, cart to field, preparing land for the drill, distribute manure, two horses; harrow, two horses; roll, one horse; drill, three horses; light roll, one horse. That is the kind of tillage we find necessary, in order to prepare the land for turnips after Italian rye grass; and the total cost upon eight acres is £16 0s. 4d., or £2 0s. 0½d. per acre. We are now arrived at the next course—the seventh year, or green fallow. We generally reserve a portion of mangold on the land, and I have fifteen or twenty acres of them now all stored on the land, for consumption upon it by the sheep. But we always run off sufficient to secure us in the long spring, that we may have food to give the sheep and cattle elsewhere. After the mangold has been removed we plough as early as possible with three horses, and put in winter tares, if any more are likely to be required. But sometimes on my farm the land is so exceedingly stiff, and the clay of that determined de-

scription, that there is an awkward pause or two, that I do not put in with roots at all. I find it better to get that land up, and let it be through the winter without a winter crop, seed it, down with winter tares in good time in the spring, and so fold it off in summer and prepare the land for wheat in that way, than to grow a root crop that cannot be consumed profitably. The whole of the root course is now ploughed, and got in order for a summer green crop as speedily as possible. As the sheep clear away the turnips and fold off the ground, so we plough the land up and prepare it at once by putting in another green crop; and the most profitable one I have yet met with is rape, which we put in with the same manure that we use for turnips, in spells, as the land is broken up and likely to be required to fall in succession for sheep; so that the mangold land is put in at once with the new green crop for summer consumption, the turnip crop also coming afterwards. Upon a stiff soil such as that I farm, I find it expedient not to winter that crop at all. I plough it up, and let it be until the spring of the year. My earliest sowing of rape is in April; and I put plenty of manure; cultivate with barley cultivator, four horses; harrow, two horses; mixing and distributing manure, two horses; drill, two horses; light roll, one horse. The expense of tillage in preparing for the summer green fallow after roots on eight acres is £6 12s. 4d., or 16s. 6½d. per acre. I have now to direct your attention to the folding off turnips and the preparation of that for the same summer crop. Break with *Coleman* as soon as the land is dry enough; let it lie and get thoroughly dry; then, after the first good rain, harrow well, and raise plenty of mould, and get the rape and mustard in to follow for the sheep. Cultivate with six horses; harrow, three horses; roll, two horses; harrow two horses, mix manure and distribute two horses, drill, two horses; roll, one horse. Expenses, taken on eight acres, £4 11s. 8d., or 11s. 6d. an acre. This comes to rather less than the mangold land, because it is done later in the spring, when the land works easier. The next point I have to deal with is the exception of which I have spoken, where a piece of land is not cropped at all—a bare winter fallow. We plough that with three horses at a convenient season in winter, and put in winter tares in February; cultivate, &c. as for rape on mangold land. The expense, taken on eight acres, is £7 13s., or 19s. 1½d. per acre. The process of feeding off the summer green crop is of course the preparation for the first year's crop of wheat. Cultivate with *Coleman's* cultivator, using smallest size triangular share close behind the sheep, six horses first time, and cross the work with four horses, afterwards harrow with heavy harrows, three horses, roll down with pair-horse roll; some labour clearing round the field; drawing out and ploughing, two horses; three harrows before drill and one after, two horses; light roll striking up furrows; water furrowing and digging corners. The expenses, taken over nine acres, are £10 15s., or £1 14s. 3d. the acre. You will observe that this is a very important reduction in the expenses of heavy-land farming—the cost of putting in the wheat. Our wheat crop, owing to this summer preparation for it, is put in at an expense of £1 4s. 8d. only per acre. These, then, are all the details of my system of management. Perhaps its principal features are, the time that is allowed for the preparation of the soil for the seed bed of each description of crop, whether corn or otherwise, that they follow on each other in such a way that ample time is allowed for a good weather-made surface for the seed which is to come. The next most important feature is the time that is afforded for the profitable consumption at a convenient time, waiting until that time comes, of the root crop that we have raised at so much expense. Under the old system you know there is the spring corn hanging over our heads, which must be got in by a certain time, and consequently the roots must be got rid of—as they say in Suffolk, the roots must either be puddled in or muddled off the land; but by this course of cropping I avoid that difficulty, and give myself sufficient time to consume upon the land, when it will bear sheep, a large amount of green crop.

In reply to inquiries by Lord Berners, Mr. HUGHES said he drilled as much rape as he did of swede turnips—about 2 pints per acre; of mustard rather less—a pint would be enough: it made the rape rather healthier for the sheep. He commenced drilling it in April, went on until June,

and mixed it all the time. It did not matter what perfection the mustard arrived at. He looked upon it as useful; but the rape was the plant. The rape he grew after turnips last year, with this preparation, and the same manure he had put on for turnips, upon the stiffest clay he had ever seen, was of such enormous bulk that he had been obliged this year to bring down his turnip platform into the field, put on the chaff-cutter, and cut the whole crop into chaff for the sheep. The wages he paid were 10s., 11s., and 12s. a week to the labourer, and 8d. a day to the women; but on the 25th of this month wages would be raised. The horses cost 1s. 6d. a day, and in justice he could not charge more; but he had the advantage of having a considerable run for them in the summer, when he got rid of them for a long time. He hired his land five years ago, at 7s. an acre, and the rent was an increasing one. He drilled his oats in rows of 8 feet, and he hoed once before putting in the seeds.

Mr. THOMPSON: But don't you find the wheat crops too heavy after two successive crops have been eaten off?

Mr. HUGHES: Not if we plant them early and thin. They will always stand, though it sounds like a fallow for wheat, which frightens many people. This land has been sheep-fed. The bottom is exceedingly firm, and we only just scuffle the sheep dung in, in preparing for the wheat; we then ridge it up for wheat.

Lord BERNERS: How much wheat do you sow per acre, and what quantity of oats?

Mr. HUGHES: I begin with a peck and a-half of wheat; of oats I use about 3 bushels to the acre.

Mr. THOMPSON: How many sheep do you keep on the farm per acre?

Mr. HUGHES: My system varies very much with the state of the markets. Generally, until this year, I have kept Dorset ewes (from 200 to 300), which, with their lambs, I have fattened; but this year the ewes being very dear, and probably mutton too will be very dear, I have put on wethers and fattened them instead, so that this spring we are not troubled with the ewes and lambs. We can keep rather more fat wether sheep than ewes, because with the ewes you must number the lambs.

Mr. THOMPSON: You appear to have no old grass upon the farm excepting the salt marshes.

Mr. HUGHES: Yes, we have a good deal of old pasture; but the sheep never see that until after the clover lands are ploughed in the spring of the year. If the spring be wet, we are driven to a dry pasture until the sheep can go to the turnip lands again.

In reply to the Chairman,

Mr. HUGHES also stated that he kept a great many cart cows and pigs, but no bullocks at all.

Mr. J. HOWARD asked what Mr. Hughes did with his horses at Michaelmas and during the autumn months, seeing that he left the clover ley until spring and the furrows untouched until January, or later in the year?

Mr. HUGHES said, that he put in winter beans and winter oats, cleaned and tilled the bean land, and carted off all that was required of the mangold, and some early turnips for the ewes and lambs in the spring. He did not use so many horses under this system as he formerly did, and he had had no idle horses in autumn since he had farmed clay land.

Mr. HOWARD: I am sure that you have not in the spring, when the great bulk of your work appears to be done. He endorsed the opinion of Mr. Hughes with reference to growing tares instead of roots on strong land. For many years that had been the custom in Bedfordshire, and it was a custom that was fast extending; for it was more profitable, and a better crop of wheat was got after it. His experience of autumn cultivation, however, was very different from that of Mr. Hughes. He thought that the sooner after harvest clay lands were broken up the better; and suggested that if Mr. Hughes got a steam-cultivator on his clay land he would have some advantage in breaking-up in the autumn, and would not find the land of so tenacious a character after treating it in that manner; nor indeed would it be necessary to put it up in 8-foot bands or ridges—a practice which he (Mr. Howard) had entirely abandoned. He had fields that rose one foot in seven, and yet he had not a single furrow or gutter upon the farm. During rains and continuous wet weather he had never seen a drop of water stand upon any of the fields, although it was very strong clay, when on neighbouring farms, where the land

was furrowed, the fields were flooded. The fact was, that when clay lands was broken up at a great depth and laid flat no furrow was necessary.

Mr. HUGHES was convinced that if Mr. Howard visited the Hampshire hills with their stiff clay, he would speedily abandon his idea of the steam-cultivator. He (Mr. Hughes) had spent five days at the Worcester meeting in close attendance upon the cultivator, and although he greatly admired its work on tremendously stiff soil, he was forced to the conclusion that upon the terrible hills of Hampshire it could not be used with advantage. He should be only too glad, however, to find that it could. It was clear that whether they ploughed flat or with 8 feet ridges it did not increase or decrease the quantity of water that fell upon the land; and the very fact of Mr. Howard seeing water in the furrows on the 8 feet ridged land, was only a proof that it was making its way off the land.

Mr. HOWARD: No; I saw it standing in low places.

Mr. HUGHES: But, in the case of land that was not ploughed up in ridge and furrow, water was still there.

Mr. HOWARD observed that it passed through the soil.

Mr. HUGHES admitted that he got out of the 8 feet ridge whenever he could; but one of his reasons for maintaining that ridge upon his farm was that the land was so entirely seasoned that he could often snatch an opportunity to pop on his harrows and drills, and put in his corn with the horses walking in the furrows; whereas, if they were walking on the flat surface they would make a furrow with their feet.

Mr. HOWARD thought Mr. Hughes entirely wrong in the conclusion he appeared to have come to, that steam was not adapted to hilly land. On the contrary, he (Mr. Howard) held that the more hilly a country was, the greater would be the advantage of steam, for the simple reason that such land was more difficult to cultivate with horses, and there was a larger margin of profit on the employment of steam. Where a horse could go steam could go there better (Hear, hear). He believed that if Mr. Hughes went into those hilly districts, where the steam cultivator was used, he would at once see reason to alter his opinion.

Mr. THOMPSON remarked, as to the ploughing of land in the spring, that he had some particularly heavy clay soil, and he found that the great thing was to have it as dry as possible: it then became mellow, and more easily worked with less labour. He thought that by ploughing in autumn they would generally secure it in a dry state; whereas, if they left the land unemployed until the spring there was great uncertainty about it, and in the North of England particularly they could not get it ploughed early enough to put in the seed.

Lord BERNERS, in proposing a vote of thanks to Mr. Hughes, said he could go a great deal further even than Mr. Howard in recommending the use of the steam cultivator and steam digger. He had had many years' experience of their use; and scientific gentlemen, when they visited his farm, said, "If you can plough up and down these hills on this strong tenacious clay, you can do it anywhere." By cultivating the old clover leys and everything he could get at in the autumn, the land was now in the most perfect state possible. The greater part of it he had only to harrow down once and pass the cultivator through it, and it was fit for all business purposes. Some years ago he adopted the Norfolk system known as the ten-furrow work, to which all his implements were made to fit, and the advantage of which was that in ploughing, drilling, and other operations, the horses trod only in the furrows, and from seed time to harvest never trampled on the land. He now found from experience that by deep draining and deep cultivation, especially autumnal cultivation, he had not, the slightest occasion to have his land any longer in ten-furrow work. And there was this further advantage, that, whilst formerly upon his strong lands he could not work the reaper, he could now cut all his corn, beans, and everything with that implement in the most effective manner (Hear, hear). To show the benefit of steam ploughing more particularly, he might mention that just before last harvest he took a farm into his own hands, eighty acres of which were in the worst possible state, overrun with twitch and almost everything that was bad. Having no horses to spare, he sent his steam cultivator on to the land, and before Michaelmas arrived he had every acre of it quite clean,

some of it having been cultivated three and four times over; and with the application of the rotary harrows of Ashby of Stamford, he succeeded in getting the land into a perfect condition. Now, if he had had any number of horses it would have been impossible for them to have broken up that land, for it was as hard as the road.

The vote of thanks to Mr. Hughes having been put and agreed to unanimously, that gentleman in briefly acknowledging the compliment wished it to be understood that he was by no means opposed to steam cultivation, and he looked forward hopefully to a time when he should be able to use it economically, even on his heavy clay farm.

CATTLE AND MEAT IMPORTATION ACT, 1864.

At a meeting of importers, salesmen, and others interested in the importation of foreign cattle and meat, convened for the purpose of considering the above Bill now before Parliament, which meeting was held at the "Salutation" hotel, Newgate-street, London, 16th March, 1864, the following resolutions were adopted, viz. :—

1st.—That any measure calculated to diminish the fatality of the diseases of cattle will be a great boon to agriculturists and the public. That having considered two Bills now before Parliament, entitled respectively "A Bill to prevent Infectious Diseases among Cattle," and "A Bill for the Amendment of the Law relating to the Importation of Diseased Cattle and Meat," this meeting is of opinion that certain sanitary clauses therein proposed may be productive of much benefit, but that other clauses directed to the same end will tend to aggravate the evil, and cause heavy loss to all classes connected with the trade in cattle.

2nd.—That the foot-and-mouth complaint is general among cattle brought to the London market, and has existed without intermission for a period of more than 25 years, and before the importation of foreign cattle; that it attacks no vital part of the body, and that the flesh of animals suffering from it is not thereby rendered an unwholesome article of food, and that a prohibition of the sale of cattle with the foot-and-mouth complaint will occasion immense loss to the owners of stock, and greatly diminish the supply of food to the public, and also greatly enhance the price of butchers' meat, and ultimately deter agriculturists from sending their stock to market.

3rd.—That it is desirable that a schedule be added to the "Cattle Importation Bill," specifying what diseases shall be considered as infectious and contagious.

4th.—That the unsoundness of cattle is a subject with respect to which an error of judgment on the part of the Government Inspectors may occasion great loss and injustice to the importer, and that, therefore, it is desirable that a power of appeal be allowed to importers, or their agents, who may be dissatisfied with the decisions arrived at by the Government Inspectors, and this meeting is of opinion that the Royal Veterinary College will be a fit authority to constitute in London for the purpose.

5th.—That it is highly desirable, owing to the great suffering and fatigue which cattle endure on their voyage from foreign ports, that the animals on their arrival in this country be immediately inspected and passed without delay, in order that they may be supplied with the necessary food, and allowed that rest so beneficial to their well-being, previous to the exposure for sale.

6th.—That the disinfecting or otherwise purifying any quay on which animals with an infectious disease may be landed, should form a part of the business of the wharfinger, as is now the case with the cleansing of cattle ships and cattle trucks by shipowners and railway carriers.

7th.—That as the importers of cattle and meat are, with very rare exceptions, residents in foreign parts, upon whom the penalty of £100 proposed by this Bill for the importation of diseased cattle and meat cannot be enforced, and that as the importers' agents, or salesmen, have no control over the shipments consigned to their care, and are in no wise responsible for the health of the animals at the time of arrival in this country, the destruction of any diseased imported animals or meat is the only preventive measure that can be reasonably enforced.

8th.—That a committee be appointed to prepare a petition, praying that the Bills now before Parliament respecting the cattle trade be amended to meet the exigencies of the trade, and to adopt such measures in reference to the enquiry which is about to take place before a select committee of the House of Commons, as may be useful.

SHORTHORN SALES.

Mr. Henry Smith's herd was sold by Mr. Wetherell, at Drax Abbey, on Tuesday, March 15. There was a good gathering, and the 46 lots realized £1,512, making an average of £32 17s. 6d. The thirty-six females averaged £35, and the ten bulls and bull calves, £25 4s. The highest priced lots were Gwendoline (Rev. J. Stainforth, 125 gs.), and Gaiety (Mr. Packe, 75 gs.).

If buyers rather stayed their hands in anticipation of Towneley, that memorable sale had no effect on Mr. Fawkes's, and in fact with the exception of Mr. Young (for Mr. Stirling of Keir), and Mr. Cruickshank, there were quite a new set of bidders for the thirty lots round Mr. Strafford at Farnley, on Friday. The summary of it is as follows:

16 cows and heifers at £58 4s. 2d.	£981 7 0
14 bulls, at £59 8s.	831 12 0
	£1762 19 0

Giving a total average of £58 13s.

The highest price was 100 gs., given by Mr. Tindall, of Doncaster, for the cow Miriam, and the lowest 30 gs., for the ten-year-old Ada. Mr. Cruickshank gave 66 gs. for Lady Marion from Miriam's dam; the Earl of Zetland bought Albion (41 gs.), and Greta 50 gs., both by Robinson Crusoe; Mr. Brooklebank, of Carlisle, took home Marchioness (65 gs.), by Robinson Crusoe, and Crinoline (65 gs.), by Bon Garçon; Mr. Eckersley, of Wigan, gave 70 gs. for Robinetta, another Robinson Crusoe; and Mr. Stirling, of Keir, 86 gs. for Balm of Gilead by Royal Oak. The principal lots among the bulls were Lord Adolphus (Lord Tredegar, 80 gs.); Lord G—— (Mr. Ralton, 71 gs.); Lord Valentin (Mr. R. Eckersley, 85 gs.); Lord Lansdowne (Mr. R. B. Wrightson, 66 gs.)—all by Lord Cobham; and Marplot (Mr. G. Bell, 81 gs.), by Royal Oak. It was a most excellent sale, and twelve lots averaged 76½ gs.

LIVE-STOCK SALES.—EDINBURGH : For the best class of cattle from 8s. to 8s. 6d. per stone, and sheep from 8d. to 9d. per lb. A lot of the best bullocks sold from £20 up to £25 10s., secondary sorts from £14 up to £18 10s. a head. A lot of very nice kyloes sold from £18 17s. 6d. up to £15 a head. Bulls sold from £14 up to £29 5s. a head. The best class of cows sold from £17 up to £22 a head; secondary sorts from £11 up to £15, and down to 48. Half-bred sheep sold from 50s. to 55s., and up to 58s. a head. Crosses sold from 42s. up to 46s. Several lots of hogs sold from 36s. up to 44s. 3d. Several lots of blackfaced widders sold from 36s. up to 45s. a head. Lambs sold from 35s. to 37s. a head. Farkers sold from 34s. to 47s., larger sorts from £3 to £4, and up to £6 a head; calves from £2 to £4 a head. **GRANTON :** A few lots of Thirlstain Castle widders sold from 56s. to 61s. 6d. A lot of very fine fat widders from Fife made 57s. 6d. A number of other lots from the same place made from 54s. to 56s. 3d. Braelangwell widders made prices ranging from 47s. 6d. to 51s. 6d.; shotts from the same lot sold from 42s. 3d. to 45s. Small Ayrshire cows made from £10 10s. to £11 10s. Best mutton made from 8½d. to 9d. per lb. **EAST LOTHIAN :** Shorthorned cattle sold from £20 to £26 12s. 6d., a few small do. from £14 to £15 10s.; polled cattle from £19 17s. 6d. to £20 12s. 6d.; Shetland queys at £12 12s. 6d.; fat cows from £11 10s. to £18 17s. 6d.; milch cows from £7 12s. 6d. to £15 12s. 6d.; fat calves from 35s. 6d. to 67s., store do. from 10s. 3d. to 23s. 3d. The following are the average prices of the different lots of sheep, viz., half-breeds 54s. 6d. to 55s.; Cheviot widders 48s. to 59s.; Cheviot Diamonds 44s. to 51s.; blackfaced widders 45s. 3d. to 47s., and pigs from 35s. to 101s.

AGRICULTURAL BOILERS AND STEAM-ENGINES; THEIR SAFE AND ECONOMICAL WORKING.

The steam-engine, which has wrought such marvels in our manufacturing systems, in land and in marine locomotion, promises from what it has already done for the past, to do as much for the future of agriculture. Time is not so far distant when the idea of using a steam-engine on a farm for any one of its multifarious and important operations would have been simply laughed at, and the application deemed thoroughly impractical and utopian. Now, however, matters are somewhat changed; and not only do we find the chimneys of engine-furnaces rising from our farm-buildings, but the steam-engine has crept into our fields, and with her usual power and success drags our ploughs and our cultivators; and thus over the green fields of merrie England, celebrated with poetic fervour in the graceful lines of Thomson, hangs the smoke cloud from the prosaic "power;" and the scream of its steam whistle drowns the light song of the careless ploughboy.

The number of steam-engines pressed by the claims of an advanced system into the service of Agriculture being at present very great, and certain yet largely to be increased, it becomes a matter of the utmost importance that those using them should know something of their principles of operation, and the general details of their construction, so that they shall be able to secure, not only their economical, but their safe working. For while we admire the ease with which their power can be controlled—a giant's power guided by an infant's hand—we should never forget that this power possesses wonderful capabilities for mischief when neglected, or when not properly controlled and worked. Economy, therefore, in the working of an engine so as to save time, which now-a-days is money, with care in its management so as to secure safety, equally demand that those employing this useful power should know how best to attain to those important ends. Nor need the uninstructed reader fear, in endeavouring to attain this knowledge, that it is beyond his province, or difficult to be mastered. For apart from the fact that a vast deal that is of truly practical value can be learned and put into use by the exercise merely of a little attention, and the use of a little common sense, there is, we take it, a direct, and to some minds a ludicrous incongruity in a farmer using a machine the principles and construction of which he is in total ignorance. A man does not work or direct the working of a plough and thrashing-machine the less easily, because he knows their construction; nor does he deem the knowledge useless because he may not be able himself to repair them when they get out of order. He is conscious that it is in very truth a valuable thing to know their construction. And the same may be said of the steam-engine and its boiler. We do not say that by reading any series of articles on the subject he will be able to dispense with the services of a skilled mechanic, and thenceforth after their perusal take not only the working, but the maintenance in good repair of the engine into his own hands; but we nevertheless venture to maintain that in a short series of papers we may be able to draw the notice of a careful reader to certain points, attention to which, and certain recommendations, the due observance of which will, in many instances, save the necessity of repairs being required *so soon as they would otherwise be*, if not attended to or neglected; and which will go far to prevent those dreadful catastrophes,

loss of life and property, occasioned by the bursting of the boilers in which its steam is raised. For it is worthy of remembrance that much damage may be done to an engine, or an explosion of its boiler may be brought about, by neglect of precautions so simple, that any man with even but a modicum of *nous* may attend to them. Moreover, as before hinted at, no one can possibly be the worse, but in every sense greatly the better, by understanding generally the arrangement and construction and the principles of working of a machine which he uses in his business; even although he does not learn *very much* by their study, if he learns *ever so little*, he is just by that so much a gainer. We hope, without endeavouring to teach all the points of practice connected with the subject, to present nevertheless a fair amount of information, which will be found practically available, and much that at all events will be popularly interesting. How far we shall succeed in the task we have thus put upon ourselves remains to be seen. Of this the reader may rest assured, that to fulfil it to the utmost bent of its capability, our best efforts will be given.

As the lungs to the human body, so is the boiler and its furnace to the steam-engine. In fact, so indispensable is the apparatus to the working of the engine, that properly we may consider a steam-engine to consist of a boiler, in which the steam is raised, and an engine in which it is used. It is obvious from this arrangement that the efficiency of the engine will greatly depend upon that of the boiler. The engine may in its arrangement and construction be everything that is calculated to give the utmost efficiency in working; yet if the steam is supplied to it defectively, or at a higher cost than it ought to be, it is obvious enough that economy in the working of the complete apparatus will not be attained. Taking this view then as the correct one, it is surprising that so little attention has been paid to the construction of boilers. The truth is, that the care of engineers for many years was chiefly devoted to the perfecting of the engine, in which the steam was used to the overlooking of the boiler, in which the steam was raised, so much so that the whole details of the boiler and the furnace were for a long time left to the ignorance of incompetent boiler makers and bricklayers; the result of this being that boilers in many districts are very much in the same position they were years ago. It is right, however, to state that competent engineers have been for some time, and are now, directing their attention to the subject of boilers and furnaces, so that shortly we hope to see as much progress made in this department as has undoubtedly been made in that of the engine.

A boiler theoretically perfect is a vessel in which the largest amount of water is evaporated in the quickest space of time, at the least expenditure of fuel, and in which the greatest strength is obtained with the least material. A variety of circumstances, however, come into play, preventing these desiderata from being easily attained. Thus, for instance, as regards the mere strength of the boiler. Practically, the strongest form is that of a sphere; but this does not meet one of the requirements of a good boiler, for sphere possesses the smallest external surface in proportion to its capacity, so that we cannot obtain the maximum of surface to be exposed to the action of the fire. Again, the maximum of evaporation with the minimum of fuel expended is best obtained by having the

largest possible extension of water surface exposed to the heat; but then this involves such a size in the boiler, that in many places it cannot be given. Again, the minimum of fuel expended depends upon the way in which the heat given out by it is made available for raising the temperature of the water, so as to use up to the utmost extent, not only the heat in the furnace, but that which leaves it, and is passed along the flue or up the chimney; but to do this involves arrangements more or less expensive. Further, the quality of the water exercises an influence upon the economical raising of steam, and this cannot always be chosen of the best, as choice is often limited in farms. The problem then of how to obtain the best

boiler is one very difficult to solve. The direction in which practice has been carried out, and also of that in which improvements will likely further be made, will now for some time engage our attention.

Boilers for stationary engines may be divided into two classes: *first*, those in which building or permanent fixing is *not* required; and *second*, those in which a permanent structure *is* required. Of the first class, or those which are independent of all building, a few good examples are met with in practice. A very common form is what is called the *multitubular boiler*. In this the boiler is placed horizontally, supported at each end by strong iron bridges. The "fire-box" (a, fig. 1)

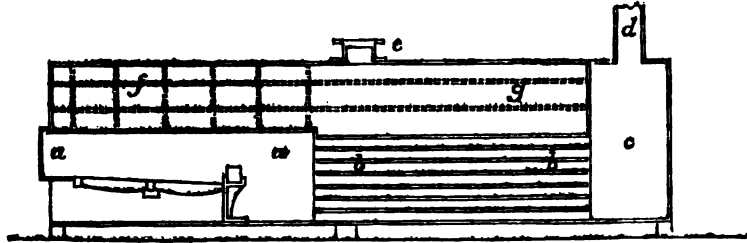


Fig. 1.

is placed at the front, and is partly surrounded by a water space; from the back part of the fire-box a series of tubes (b b) are led; these pass longitudinally right through the boiler from end to end, and communicate with a space (c) at the back called the "smoke-box." These tubes are generally from two to three inches diameter, and convey the smoke and heated air and flame from the fire-box to the smoke-box, and from thence to the chimney (d); e the manhole door; f g horizontal and vertical stays, used to strengthen the boiler. By this arrangement we obtain a large amount of heating space in a very small bulk of boiler. The sketch illustrates the arrangement. The draught here is what is called a "direct or oven-draught." In the very excellent form of boiler for agricultural purposes introduced by Mr. Carrett, of Leeds, a "return draught" is obtained by the using of a

large internal flue (a fig. 2), which communicates with the smoke-box, and from which the heated air is returned again in the direction of the fire-box by small tubes (b b) placed above the central flue; and which finally lead the smoke, &c., to the chimney (e) in this case placed above the fire-box. In the multitubular boiler of portable engines a strong draught is created so as to give a rapid current through the tubes; by passing the exhaust steam

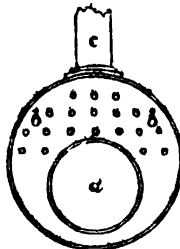


Fig. 2.

from the engine into the chimney in the form of a vertical or rising blast. This form of boiler is that which is generally used for portable steam-engines; and although used in the manufacturing districts for stationary engines, there are some points connected with it which do not make it so usefully applicable as the one we are now to describe, and which is called the *vertical or upright tubular boiler*. This consists of a shell or barrel (a, fig 3) standing vertically, and crowned with a flat or domed top. The fire-box (b) is of course at the base, and is provided with a roof or top, from which the rising tubes (c c) start, and into which they are properly secured. The whole of the tubes lead into a hemispherical smoke-box (d), terminated at its upper end by the chimney (e). In

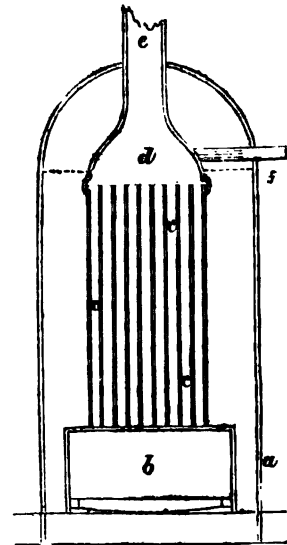


Fig. 3.

hemispherical cap which passes through the steam space the water-level being at the top of the tubes; f is the steam-pipe. In a modification of the vertical boiler some times used, the tubes are dispensed with, and a "large fire box" substituted, in the interior of which the heated air or flames from the fuel play; the top of this is furnished with a hemispherical or curved dome, the highest part of which is three inches below the line of water-level. The chimney is inserted at this part, and leads off the products of combustion through the space occupied by the steam which is thus partially super-heated. A good idea of the

form of vertical boiler may be obtained by supposing the tubes *c c c* to be taken out of fig. 8. The flame and heated air from the fire *b* playing inside of the space thus formed. The dimensions of a boiler of this class for a given power are larger than those of a vertical boiler with tubes, as the heating surface is obtained by superficial fire-box surface. To obtain the same amount of heating surface as in the multitubular vertical, the fire-box has to be increased, and this increases the diameter of the outer shell. The fire-box (*b*) of the last example (fig. 3) is completely surrounded with awater-space varying in breadth or thickness from three to six inches, according to size of boiler. Of these three forms (figs. 1, 2, and 3) of boilers of the class, "independent of building," we believe the vertical multitubular to be one of the best for stationary agricultural purposes.

The best materials for multitubular boilers is a subject which is at present engaging the attention of engineers. In the locomotive engine boiler—the prototype of this form of boiler—the tubes were originally, and have indeed, with few exceptions, all along been made of brass. This material being deemed to be the most economical; and possessing as it did the facility of being pieced, old tubes could be taken out and their defective parts replaced by new. The result recently made known of experiments which have been carried on for several years would seem to indicate that in the capability to transmit heat, iron tubes are as good as brass ones, and that they are actually superior in point of durability. Iron tubes being of the same material, cause obviously less inequality of construction than when brass tubes are used. And they are found generally to have less liability to split in the direction of their axis. Further, and not the least valuable of their characteristics, iron tubes are almost free from the liability to explode, at least as compared with brass tubes, which often burst. There is one advantage, however, which has been possessed by brass tubes, that is they have been drawn out of the solid, while iron tubes have been "lap-welded." Several plans have been patented for the purpose of drawing iron-tubes out of the solid, but none seem likely to be so successful as that which we believe is now, being worked by the Solid Drawn Iron and Steel Tube Company. The tubes are drawn cold without the action of fire, and are said to possess great strength with comparative thinness. On the whole, then, we may predicate that iron tubes will ultimately become universally used in all forms of multitubular boilers.

The placing of the tubes in multitubular boilers is a matter of considerable importance. In agricultural engines, the lower tubes are placed at a wider distance apart than those of the upper lines, and this in order to admit of the easy deposit of sand and other impurities arising from the too often dirty condition of the water supplied by the attendant. And while on this point, and as it is here suggested to us, we would impress upon the reader the importance of providing as clean a supply of water as possible for the working of his steam-engines boiler. Any kind of water is often considered good enough, but the advantages of having good water for boiler purposes can scarcely be over-stated. With muddy water, the boiler rapidly becomes burned out in the lower plates; and if "priming" is not prevented—that is, if water is carried over with the steam and passed through the cylinder—the reader may easily conceive that the impurities carried over with it will by no means add to the efficiency of the engine or to the maintenance of its good repair.

And while on this subject of multitubular boilers, it may be worth while to mention that many engineers are beginning to see the disadvantages of the principle which it involves, namely, of having the heated air from the furnace to pass through the interior

of the tubes, the water surrounding their exterior. Thus, in consequence of the carbonaceous fuel generally consumed in the furnaces of boilers, a rapid deposition of sooty particles takes place in the interior of the tubes; so that, in a short space of time, the evaporating powers of the boiler decreases. The consumption of smoke, so called, or that of coke in the place of coal, will doubtless prevent this; but unfortunately the latter fuel is too dear, and not always easily obtained. And as to the former, namely, the consumption of smoke, we fear that, involving as it does more the careful superintendence and stoking of the furnace than even the use of special apparatus, it will be a long time before it will be the rule with our agricultural engines; but more on this point hereafter. A very good plan to clean rapidly the interior of the tubes is applied on some railways, and may be as easily applied in farm engines. It is simply the application of a flexible tube to the steam space of the boiler, and which is terminated with a nozzle, fitting tightly into the ends of the tubes of the fire-box; on opening a cock placed in the tube, the blast of steam projected along the tube effectually and instantly cleans it from all adhering soot. In default of this apparatus, a circular brush—in cheap form, now manufactured for the purpose—with a long handle or bar attached, may be used. But apart from the danger there is of tubes furring up in the way we have indicated, some engineers take exception to the principle of surrounding the tubes with water, and passing the heated air through the interior. This they maintain to be erroneous, and that the exact converse is the true principle. Assuredly for economy of working few boilers can compete with that in which the principle is carried out of tubes filled with water, and the heated air and flames playing round their external surfaces. The diagram

(fig. 4) shows the "French," or "Elephant" boiler, constructed on this principle, which is found in practice to be economical and efficient; *a a* the boiler, *b b b* the pipes in which the water is placed, the heated air playing on their exterior. In Galloway's boiler, another very economical form in which this principle is adopted, the fine space (*a a* fig. 5) behind the furnace is occupied with a series of taper tubes (*b b b*), the taper being such that their widest ends, 10 to 12 inches in diameter, are connected with the upper side of the fine, while the lower ends are the narrowest, some five or six inches in diameter, and connected with the lower water-chamber. This conical position given to the tubes not only prevents priming, but ensures a very effective play of the flames and heated air upon their surfaces, and further prevents their burning where they join the boiler. One immense advantage of this system of boiler-making for stationary engines is, that it enables the pressure to be confined within vessels of the smallest possible diameter; and this is perhaps the surest safeguard against explosions, for the strength of the shell of a boiler is inversely as its diameter; so that by decreasing the diameter of a boiler, say one-half, we

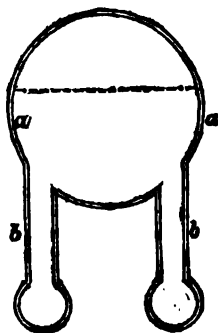


Fig. 4.

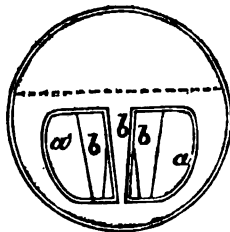


Fig. 5.

advantage of this system of boiler-making for stationary engines is, that it enables the pressure to be confined within vessels of the smallest possible diameter; and this is perhaps the surest safeguard against explosions, for the strength of the shell of a boiler is inversely as its diameter; so that by decreasing the diameter of a boiler, say one-half, we

double its strength or resistance to explosion. This small water-filled tube principle is carried out, to a remarkable extent, in a boiler known as the "Duplicate, or Retort" of Messrs. Dunn, illustrated in the diagram (fig. 6), and which consists of a series of small tubes (a a a), 19 inches in diameter, placed in a furnace (b b b), and communicating with a steam chamber (c c) above by a series of vertical tubes.

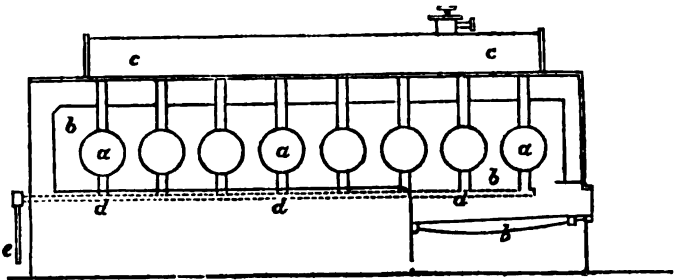


Fig. 6.

This boiler is not only immensely strong—one of the tubes being found in actual practice to have stood a pressure of 525lbs. to the inch before it gave way—but in portability and consequent ease of transit and in being set up, it stands alone. Again, it admits of the maximum nearly of the effective heating surface of the grate being applied to the tubes; while, being round, they can be repeatedly turned so as to be exposed all over their surface to the action of the flames. This boiler appears to us to possess nearly all of the requisite qualities which should characterize a boiler for a stationary agricultural engine, especially in districts far removed from railways, or where transit of heavy, bulky boilers of the ordinary description is difficult and expensive. In its capability of being easily repaired it possesses also considerable merit; for if one of the tubes bursts, all that is to be done is to take it out and to apply a flange to the end of the vertical tube connecting it with the steam chamber, when the boiler will be as efficient, nearly, as ever; or a spare tube or two may be kept to replace a damaged one. As all the tubes will rarely be out of repair at once, this boiler may be depended upon for working at all times. It possesses another excellent feature, which still further recommends it for agricultural districts, where bad, muddy water will be used by the attendants, despite the wishes of their master; and this is, that the tubes in the series being connected by a pipe (d d d, fig. 6), this will act as a mud-collector, from which it may be withdrawn at e. To this a cock is applied, by which the sediment is blown out from time to time. A high authority in boiler engineering states that he "has never seen any mud-collector approach in simplicity and effectiveness this of the duplicate retort boiler." In all boilers where there are a number of connected water-spaces, the last—that is, the furthest from the furnace—collects the mud.

The boilers last described (figs. 4, 5, and 6) belong to the second class we have named—that is, those which require building or setting in brickwork. Another form belonging to this class is the "common egg-ended" boiler, which is simply a cylinder of wrought iron, of which the plates are riveted together, and hemispherical ends are provided, these being given to it because the strain upon

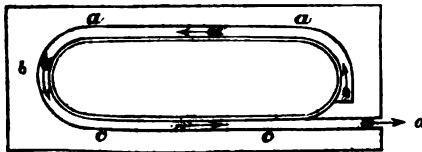


Fig. 9.

(fig. 9) is the safest, then, of the two. Another method of setting a boiler of this class is to provide it with an internal flue (a, fig. 10). The heated air passes, as before described, from the furnace, over the bridge, and to the back part of the building. It then rises up, and re-

turns through the flue (b, fig. 10) in the boiler to a space above the furnace (as at c), where it divides, and passes away right and left (as at d e) by means of side-flues leading to the chimney-shaft. This is called a "split draught." The water-level in the egg-ended cylindrical

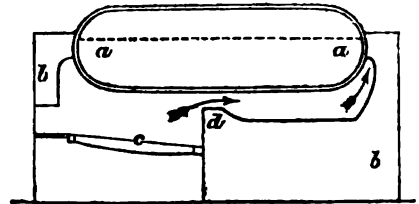


Fig. 7.

7) is supported by a brick building (b b), the furnace (c) being at one end; and the flames and smoke are passed along over the "bridge" (d) to the back part of the boiler, where they rise upward, and are passed by means of a partition into side-flues (a a, fig. 8), the upper parts of which are or should be below the water-line in the boiler. One of these flues (as a a, fig. 9) runs along the whole length of boiler back towards the front of the boiler, then is passed round the front (b), and returns along the side-flue (c c), in the opposite direction, till it finally joins with the vertical chimney-shaft near d. This arrangement is what is called a "wheel-draught," and is in every way better than what is called the "direct or oven draught," in which the flame and smoke pass at once from the furnace c, along its under-side, over the bridge d (fig. 7), and from thence directly to the chimney, side-flues being altogether dispensed with. Boilers set in this fashion, namely, on the direct or oven draught, are apt to become heated above the water-line, by the flames being allowed to pass over the higher plates, these being exposed by the boiler being placed low down, so as to obtain as much heating surface as possible. The "wheel-draught"

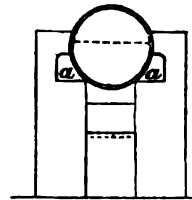


Fig. 8.

turns through the flue (b, fig. 10) in the boiler to a space above the furnace (as at c), where it divides, and passes away right and left (as at d e) by means of side-flues leading to the chimney-shaft. This is called a "split draught." The water-level in the egg-ended cylindrical

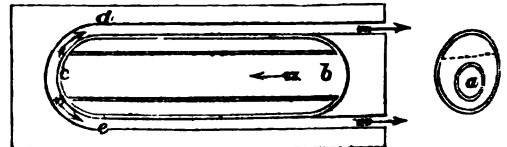


Fig. 10.

boiler is kept at a point some three or four inches above the level of the highest part of the side-flues.

The second example of stationary boiler in fixed buildings is what is called the *Cornish boiler*, and it consists of a cylindrical shell (*a a*, fig. 11) with flat ends. The furnace is not, however, below the boiler, as in the example last described, but is placed at the end (*c*) of a large internal flue (*b b*), which runs along from end to end of the shell or outer case. The fire-bars are placed across the tube or flue, as at *d*, resting on one end on a brick bridge (*f*) built up in the flue, and at the other on what is called the "dead plate" (*g*), to which the furnace-bars are attached. The "bridge" is carried up to within a distance of from 4 to 6 inches of the crown or roof of the flue. The upper part or half of the furnace is thus formed by the semicircular part of the flue; while the ash-pit is formed by the lower half. The Cornish boiler is commonly set in brickwork, and the flues are arranged in one of two ways (as in figs. 9 and 10): first, on passing from the end of the internal flue, the heated air rises upwards and is split into right and left directions, passing along two side

flues, one at the right, the other at the left of the boiler, to the front, where they join above the furnace, and pass into the common flue or chimney-stack; or the heated air passing from the internal flue is led into a right-hand or a left-hand flue, traversing along the boiler and passes round the front of it, traverses the other side-flue, and from thence into the chimney-stalk.

Of these two classes of fixed boilers (the Cornish and egg-ended cylindrical) adapted for stationary engines, the cylindrical egg-ended boiler is undoubtedly the safest, although it is not the most economical. Provided with a good safety-valve, the supply of water kept carefully up to the proper level, and sundry points—not very difficult to be understood, and which we shall afterwards explain—being attended to, there is scarcely any chance of an accident with this form. There is an additional degree of safety in this boiler from the latitude of the water, or rather the limits of the water-level between too high and too low being pretty wide, as the whole interior of the boiler is free for water or steam space. This is not the case in the Cornish or flued boiler, as the margin

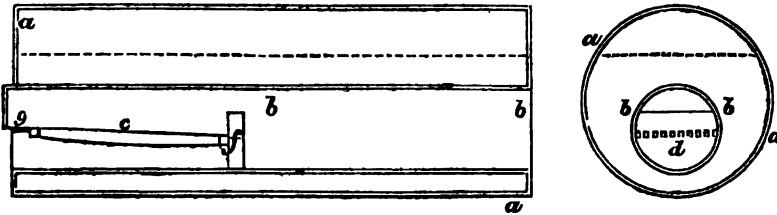


FIG. 11.

of the water-level is necessarily not so great either in the too high or too low condition. The Cornish boiler is, however, the most economical of the two, it requiring much less fuel, and is less expensive, as it requires less building; and where the proper level of the water is carefully attended to, so that the water never passes below the crown or upper part of the internal flue, it will be safe. In districts where coal, then, is dear, we should recommend the Cornish boiler to be used for stationary engines, that is, if a boiler of this class, having fixed buildings connected with it, is chosen. Boilers of this class, the egg-ended and Cornish kinds, are provided with apertures placed above the furnace, which apertures are filled in with a plug of fusible metal; so that should the water run low in the boiler, and the plates become over-heated, the fusible plug is melted, and the water escapes and drowns the fire out. The Cornish boiler is, we need not say, from the greater number of its joints, much more liable to get out of repair by the plates leaking than the egg-ended cylindrical.

Comparing the two classes of boilers we have now described—namely, those having permanent buildings and those having none—those of the former class are decidedly the safest and most economical in use; we mean the egg-ended cylindrical and Cornish boilers. The multitubular horizontal and multitubular vertical, belonging to the second class, are in every way the most delicately constructed. Their internal arrangement of flues and tubes require more of skilled labour, not only in their construction, but in looking after their repair; we therefore come to the decision that, for fixed or stationary engines, the Cornish boiler, for agricultural purchasers, is the one which is at the same time safest and most economical; although, if mere safety is concerned, the egg-ended cylindrical is the best.

The arrangement of the boiler of a fixed engine, with reference to the engine, varies according to circumstances. In some cases the boiler is placed in a separate building near to, but quite distinct from the engine-room. We should recommend the boiler-house not to be placed

under the general roof of the steading; but outside the wall, of course in a covered shed. This position should be immediately next the engine-room, so that the steam-pipe shall be of the shortest. In a long steam-pipe not only is the steam lost through condensation, but much loss arises through friction. Much of the loss arising from radiation will be prevented by clothing the pipes with felt, this being also covered with canvas.

The boiler being, as we have before said, the source of power, the amount of work depends obviously upon the way in which its generative capabilities are managed; when, therefore, we wish to produce the maximum of mechanical effect with the minimum of fuel consumed, we must attend first to the *perfect combustion of the fuel so as to produce the greatest amount of heat*; and second, to the way in which that heat is transmitted to and absorbed by the boiler surfaces. These two points are connected with what we call the economical management of a boiler. But useful as a boiler it is, it is, if carelessly managed, a dangerous thing: and *mismanagement* tends often to fearful loss of life and destruction of property; it is essential, therefore, to know the way so to manage it that while we work it economically we also may work it safely. The whole subject then of Boiler Management may thus be resolved into two great departments—"economical" and "safe working;" we so resolve it, as it gives us a facility for clearness of arrangement in our remarks, although it may be said that the one involves the other.

The *perfect combustion of fuel*, being the first point connected with economical management of boilers, will then first engage our attention; and this at once involves arrangements closely connected with what is called "smoke consumption." If we were asked to state on what the perfect combustion of fuel in the furnace of a steam-engine boiler mainly depended, we would say "good stoking." But to ensure this *good stoking*, skill and attention of no ordinary kind are required. It is a common thing to say that anybody can fire an engine; and that this is widely be-

lied in is credible enough, when we see those whom we set to work at the job. We believe that you may get any "odd man" to stoke your furnace, and that he will do so after a fashion; but there are always two ways in which a thing may be done, the right way and the wrong one, and we rather think that this odd man will do it in the wrong way. We have heard it said that all you require is a lot of coals, a shovel, and a man to fling the coals into the furnace; but unless the man at the end of the shovel has a mind to direct where the coals and how they are to be flung by it, we very much fear that they will be flung to little economical purpose. We have stoked a good deal ourselves in our early apprentice days, and we were not long in discovering that we might use many coals and get little steam by bad stoking; but by careful stoking we could keep up a steady supply of steam with a much less quantity of fuel. In what then does good stoking consist? We remember well that among the first lessons we learned in stoking was this, the benefit of selecting and preparing the fuel, which was supplied to us generally of a very mixed character, a quantity of slack being mixed with large pieces. We soon saw that we did very little good comparatively with the masses of large coal, or with mixed fuel, large and small together. The more uniform then in size the coal is, the better, and the size should not be larger than a man's fist; and the slack, if slack is used, should be used separately, and carefully damped with water. Having obtained your coal in proper condition, the next thing is how to put into the furnace. The best mode has been thus stated: "Fire thinly, fire frequently, fire regularly." Now, from this will be seen the importance of attending to the condition of your coal; for thin firing will not be compatible with large or unequal-sized masses. Watt saw at a very early date the importance of attending to this point, the breaking of the coal into pieces of a uniform size; for with every engine he sent out, he sent also printed directions as to its management, and in which he said as the first point: "Break every coal that is bigger than a goose's egg." And in the second: "The oftener you fire and the thinner the better. The fire should be kept an equal thickness and free from open places, or holes, which are extremely prejudicial, and should be filled up as soon as they appear." All authorities who have given their attention to the subject of the economical working of boilers agree as to the importance of attending to the stoking, not only as the best way to ensure economy in the consumption of fuel, but to prevent those thick masses of smoke which too often issue from the chimneys of our steam-engine furnaces. The following advice upon stoking is from a code of rules which has been followed with great advantage in the stoking of steam-boat furnaces, and is worthy of attention in the matter of stationary boilers: "Begin to charge at the end next the bridge. Never allow the fire to be so low, before charging, that there shall not be from four to five inches of red-hot fuel equally spread upon the bars. At all times keep the bars equally and well covered, particularly at the sides and bridge end, where coals burn away most rapidly." But not only is thin firing and frequent firing important, but much depends upon the regularity of firing. If you fire at irregular intervals, it is quite obvious that you may supply too much coal at one time and too little at another. A thoroughly practical friend of ours has shown the effect of regular firing in a very plain and convincing way. "Suppose a furnace, the bars of which are so proportioned as to admit sufficient air for the proper combustion of 60 lbs. of fuel per hour. Now, if once every minute we could throw evenly over the fire 1 lb. of coal, it is obvious that the quantity of coals in the bars would be nearly invariable; because it would be supplied just as fast as it was consumed, and the demand for air would be constant.

In hand firing (irregular) a different operation takes place: the coal is thrown on, say 15 lbs. of coal every fifteen minutes, and the consequence is, that for one half the time too little air passes through the bars, and for the other half too much."

The following are practical directions for the firing of stationary boiler furnaces. The first point is to prepare the coal the way we have already pointed out; the next is to put some water in the ash-pit, and then "begin by discharging into the further end of the furnace, reaching to about one-third the length of the grate from the bridge, as rapidly as possible, from a dozen to twenty or thirty spadeful of coals, until they form a bank, nearly or quite up to the top of the bridge, and then shut the fire-door. In firing up, throw the coals on the rest of the grate by scattering them evenly from side to side, but thinner at the front near the dead-plate than at the middle or back. In this manner keep the fuel moderately thick and level across the bars; but always thicker at the back than the front, not by *pushing the fire in*, but by *throwing the coals exactly where and when they are wanted*. Never for a moment leave any portion of the bars uncovered, which must be prevented by throwing or pitching a spadeful of coals right into any hollow or thin place that appears; and always remember that three or four spadeful thrown quickly *one on the top of the other*, will make no more smoke than one, and generally less. But all depends upon doing it *quickly*, that being the main, if not the only point in which freedom from smoke and great economy of fuel agree; some firemen only putting on three spadeful, while another can put on four, and make twenty per cent. more steam in the same time, by doing it. In replenishing the fire, take every opportunity of keeping up the bank of fuel at the bridge, by recharging it, one side at a time. Whenever this bank is burnt entirely through, or low, and also when the fire is in a low state generally, take the rake and draw back the half-burnt fuel twelve or eighteen inches from the bridge; and recharge fresh coal into its place upon the bare fire-bars as at first."

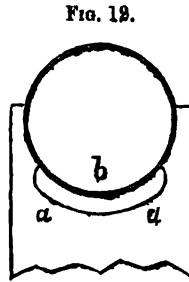
But important as good stoking is, it is quite clear that much of it, however well carried out, may be lost if the arrangement and construction of the furnace are such as to bring about a condition of matters inimical to perfect combustion. And yet it is, we are sorry to say, but a truism that attention to furnace details is rarely given. Take, for instance, the "fire-bars." A ready admission of air being, as we shall presently point out, an essential element in successful combustion; it does seem remarkable that fire-bars should be so often made of such thickness, and so set in the furnace, as if the object they were intended to serve was the exclusion of the air. Improvement is open in this direction by the use of the "argand," and other patented forms of fire-bars, where strength is obtained with a large amount of air-way. Mr. Louch has introduced a form of very thin fire-bar, or rather fire-grate, made up of thin plates of wrought-iron, kept apart by pieces inserted between them, and the whole riveted together. This has, we believe, given excellent results in practice. Another disadvantage arising from the ordinary thick fire-bars, with their air spaces—an arrangement of course the *reverse* of what it ought to be—is the frequent use of the rake or bent and pointed tool, by which the fire-bars are kept clean, or attempted to be kept clean, of "clinkers," and the air spaces between them. We believe that the loss sustained in working steam-engine furnaces by this frequent raking and poking is very considerable. Having had some experience of the "reciprocating or lever fire-bars," as well as having heard them highly spoken of by those who have used them, we are strongly inclined to recommend their use. They will at all events greatly facilitate good stoking, for it is surprising how clear and

clean a fire their use gives. In one patented form one-half of the fire-bars are made to move in one way, the other half moving in the contrary direction. Both, of course, move in the direction of their length, but at the same time in a slightly vertical direction as well. The result of this movement—something approaching to that of the shakers of a thrashing machine—is a movement of the clinkers or ashes resting in or jammed between the fire-bars.

We now come to take up other points connected with the setting up and working of boilers for stationary engines.

The setting of the boiler in the furnace, and the having at command a surplus of draught, are essential features to be attended to. For the fire-places of stationary engines, the rule is to have 1 foot of fire-grate space and 15 feet of boiler surface exposed to the action of the flame and heated air, for every horse-power in the boiler. It is, however, a safer plan to have an excess rather than a deficiency of furnace-room, as slow firing is always the most economical. Where smoke-consuming, as it is termed, is carried out, by arranging proper apertures for the admission of the air in the manner we shall presently explain, the area of fire-grate should be increased at least one-fifth. A good command of fire-draught will also tend to ensure economy of fuel. For a boiler of ten-horse power, a shaft 30 to 40 feet high, with an internal flue of a foot square, will ensure this. A damper should be supplied to the throat of the chimney, where the flue enters it; and the chain connected with this carried over pulleys, and be terminated by a counterpoise weight hanging near the furnace-door, within easy reach of the fireman. We place great importance upon the judicious use of the damper where an excess of draught is at command. The value of an excess of draught is obvious enough when we consider that if the draught is simply sufficient to ensure a supply of steam or fair combustion of the fuel under ordinary circumstances, we have nothing to fall back upon, when extraordinary circumstances, as a greater demand upon the engine, or a bad quality of fuel, necessitates the quickening of the draught. If we have not this within our command by means of the chimney, we are compelled to stoke freely and fire rapidly—both wasteful proceedings. Another most important element in the economical working of a boiler, is having plenty of space in it. It may be taken as an axiom that a boiler larger than the estimated power of the engine will be cheaper in working than one simply sufficient for the engine. Thus, for an eight-horse engine we would give a ten-horse boiler.

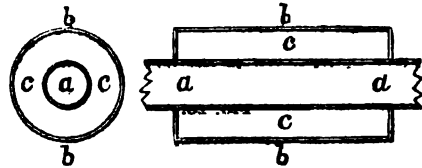
It is a very common thing for the purchasers of steam-engines to be told that the theoretical duty of the fuel consumed in the furnace of a steam-engine is often nearly obtained in practice. This statement may be made by interested parties who may have some patent smoke-consuming or other furnace appliance to push off; but it is so far from being the truth in practice, that as a rule little more than a ninth down to as low as a twelfth of the duty of the fuel consumed in the furnace is actually obtained. There are two sources of loss of this duty—first, in the waste heat going up the chimney; second, in the waste steam of the engine—both being passed into the atmosphere, and both carrying away sources of heat which might be made available in raising an increased quantity of steam, or, which is the same thing, raising the temperature of the feed-water for the boiler supply. Both of these losses have been attempted to be obviated by various contrivances. It is found, for instance, that if we pass the heated air over rough surfaces rather than smooth ones, more heat is abstracted from the air. With a view to take advantage of this, projections have been made from the boiler surface,



arrangement is a series of vertical tubes, and is found to give good results in practice.

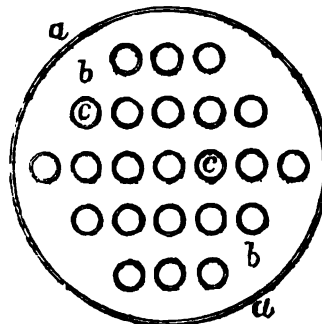
The methods adopted or proposed for using the waste steam of the engine in heating the feed-water are numerous. The simplest method, and one very largely used, is to pass the exhaust steam-pipe (a a fig. 13) through

FIG. 13.



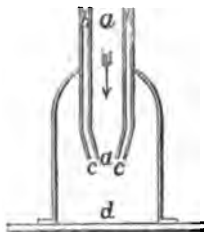
another pipe (b b) of larger diameter; the annular space (c c) between them being filled with cold water passing from the pump, and from thence to the boiler. Although simple, it is obvious that this plan is not the most economical. The thickness of the pipe and the form of it does not give out full per-centage of the heat of the steam within it. We would either reverse the arrangement therefore, and while making the steam-pipe large would send through it a series of small pipes containing the water to be heated, or we should send the steam through a series of small tubes surrounded by the water in the large tube. We should thus by either of these plans gain a large amount of heating surface (see fig. 14), (a a) the

FIG. 14.



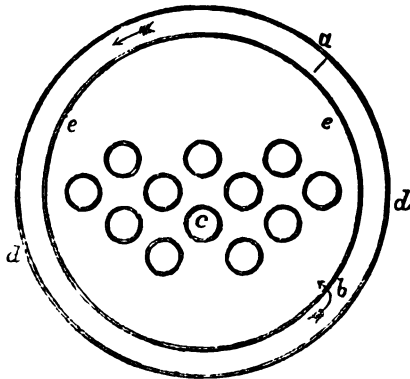
vessel containing the feed-water (b b) which surrounds the pipe (c c), through the interior of which the waste steam is passed. Mr. D. Kinnear Clarke, the well-known locomotive engineer, has patented a very ingenious and effective form of feed-water heater. In this the steam is passed into a short tube (a, fig. 15), into which the cold water is supplied in the form of a thin ring, round the

FIG. 15.



steam nozzle (*b b*). The steam entering within this ring of water at *c c* is continually condensed, and breaks the water into a spray, and very quickly raises its temperature. The use of this simple apparatus—which is very easily applied to agricultural engines—has been found to effect a saving of 10 per cent. Cold water passed into the heater at 39 degrees has passed out of it at 191 degrees. In the form of boilers having smoke-boxes—the case in all tubular boilers—a source of rapid deterioration at the smoke-box and plates is found to arise from the high temperature of the air admitted to the smoke-box interior. Some idea of this rapid deterioration may be obtained when we state that the heat of the smoke-box is such as to burn or scorch light materials when placed in contact with it, especially when long and heavy firing has been carried out. With a view to obviate this evil, and to take advantage of the heated surface thus created, in order to reduce the consumption of fuel, Mr. A. B. Brown in his patent has secured a mode of encircling the smoke-box end with an annular space, into which the feed-water is pumped at a point near the top, and made to circulate completely round the annular space and thence taken to the boiler. In fig. 16, *d d*

FIG. 16.



represents the outer ring of water space, the cold water being pumped in at a well entering the boiler at *b*; *c c*, the smoke tubes; *e e*, the steam space. As the flame and the heated air are under the influence of the blast projected with great force against the smoke-box door, this also is very rapidly deteriorated, and a source of heating surface wasted under ordinary circumstances. Mr. Brown makes the smoke-box door double, and, by a very simple water-space hinge, is enabled to pass water into the space thus made, and thereafter through the other hinge to the boiler. This water-heater we consider a very admirable and effective plan, serving two ends at one and the same time, obviating a waste both of material and heating power often complained of.

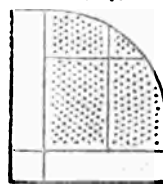
Where the management of the furnace is such that black and dense volumes of smoke are passed from the chimney immediately upon and for some time after firing, or adding fuel, we may rest assured of this, that we are working wastefully; for the black volume is made up of an infinite number of atoms, or particles rather, of unconsumed fuel. The importance, then, of consuming these particles in the furnace, where they will give out a useful

effect, is obvious enough, and leads us easily to understand why such a host of inventors should attempt still, as they have long before attempted, to introduce arrangements by which economy in this direction could be secured.

When air is not supplied in sufficient quantity, and at the proper time to the furnace, on its being supplied with a fresh store of fuel, a large portion of the carbonaceous matter is unburnt, and the temperature of the furnace so lowered, that the carburetted hydrogen and coal-tar gas which are disengaged from the fuel are not properly consumed. Black volumes are therefore carried away by the draught. Air is, therefore, all that we require; but to give it in proper quantity, and in the proper way, is rather difficult. Air is required to be admitted in a state of diffusion, so that it will intimately mix with the gases in the furnace, and at the place where the furnace is at the hottest. It is just because this hot condition is not attained in defectively arranged furnaces that smoke is produced; for the fresh fuel lowers the temperature and covers up the air spaces between the bars, so that the air, which, if admitted, would increase the combustion of the fuel and raise its temperature, cannot gain admission when most required. Some engineers attempt to consume the smoke, as the phrase goes, or rather to prevent its creation, by opening the furnace door after the fuel has been supplied; but this admits so much air that the furnace interior is cooled, which is certainly not the object aimed at.

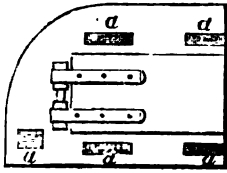
No one has perhaps given so much attention to the subject of smoke prevention as Mr. C. Wye Williams; and although he has been much abused, and his statements carped and quibbled at, we conceive that this part of the science of boiler engineering has been greatly enriched by his investigations. We have only to mention one fact in evidence of this, and that he is at all events thought so highly of by our first-class authorities that, out of 103 plans sent in to compete for a prize of £500, offered by the Steam Collieries Association of Newcastle-on-Tyne, his plan was accepted. The committee of investigation, comprising very eminent men, amongst others Sir William Armstrong, paid great attention to the subject; so we are justified in supposing that the plan of Mr. Williams is distinguished by first-rate efficiency. The committee say in their report, Mr. Williams's system (his original one) consists in the admission of air at the furnace-door by numerous small apertures, with the intention of diffusing it in streams amongst the gases. In the plan adopted in the present instance, Mr. Williams introduces the air only at the front of the furnace, by means of cast-iron casings, furnished on the outside with apertures provided with shutters, so as to vary the area at will, and perforated in the inside with a great number of half-inch holes. The mode of firing which Mr. Williams adopts merely consists in applying the fresh fuel alternately at opposite sides of the furnace, so as to leave one side bright, whilst the other is black.

The following are Mr. Williams's own sketches and description of the plan. Fig. 17 shows the half of the inside mouth-piece, or casing; fig. 18 giving a half outside view of the same; showing three of the six large apertures through which the air passes to the interior of the four separate boxes for distribution. The gross area of these six openings give 80 square inches, equal to 5.33 for each square



foot of furnace. The orifices of the inside mouth-piece in fig. 17 give the following: 105 orifices of $\frac{1}{8}$ -inch in

Fig. 18.

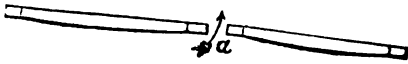


the box above the door; 120 orifices of $\frac{1}{4}$ -inch in the door box; 120 orifices of $\frac{1}{4}$ -inch in the two side air boxes; 345, equal in area to the 80 square inches in the outside openings. "By these numerous apertures, first, free admission is

given for the requisite large volume of air, and, secondly, for its division into numerous small portions, by which an immediate diffusion or mixing operation is effected with the gases in the furnace chamber as fast as they are generated."

In Mr. Armstrong's furnace arrangement—and he is a first-class authority in boiler engineering—the air is admitted at the hottest part of the furnace—as shown in the drawing (fig. 19). The inlet aperture is made through

Fig. 19.



a hollow or double-bearing bar, between the first and second of two or three lengths of fire bars; so that it is surrounded on all sides by fire and flame, like the air supplied to the interior of the annular flame in the argand lamp, which by the way affords the best known instance of a perfect smoke preventive. Mr. Armstrong makes his front fire bars thinnest, where quick combustion is required; the back being thickest. The stoking is done, or should be done, so that the fuel is charged thick at the back of the grate, reaching nearly, if not quite, up to the top of the bridge, and made to slope gradually down to the margin or inner edge of the air aperture. The front bars are supplied in the ordinary way—that is, thinly and frequently.

For portable engines, a plan is often adopted called the "baffle," or "shovel," this being a deflector at-

Fig. 20.



tached to the inner side of the fire-door (see fig. 20), so arranged that it deflects the air admitted through openings in the door down upon the fuel. A still better plan is that patented by Mr. Kinnear Clarke, applicable to engines with a square fire-box, in which minute blasts of steam are projected through the sides of the box in such a way that they mix the air most intimately among the gases, and effectually prevent the formation of smoke.

Having gone pretty fully into the economical, let us glance at the safe working of the boiler. Much of the safety of a boiler depends upon the form in which it is made, upon the goodness of the iron plates of which it is composed, and lastly upon the way in which these plates are put together. Mr. Fairbairn, one of our highest authorities, if not the highest, on the subject, has pointed clearly out that defective construction is "unquestionably one of the greatest sources of the frightful accidents which we are so frequently called upon to witness. No man should be allowed unlimited exercise of judgment on a question of such vital importance as the construction of a boiler, unless he is duly qualified by matured experience in the theoretical and practical knowledge of form, strength of materials, and other requirements requisite to ensure the maximum of sound construction. It appears to me equally important that we should have the same proofs and acknowledged system of operations in the construction of boilers that we have in the strength and proportions of ordnance. In both cases

we have to deal with a powerful and dangerous element, and I have yet to learn why the same security should not be given to the general public as we find so liberally extended to an important branch of the public service. Boilers and artillery are equally exposed to fracture; and it appears to me of little moment whether the one is burst by the discharge of gunpowder, or the other by the elastic force of steam. It surely becomes a desideratum to secure the public safety by the introduction of some general acknowledged system of construction that will bear the test of experience, and involve a maximum power of resistance. The most elaborate disquisitions have been given, by the most distinguished men of all ages, since the invention of gunpowder, to discover the strength and form of guns of every description. Surely boilers are equally if not more important, as the sacrifice of human life appears to me to be much greater in the one case than the other. It would be a matter of paramount importance to the public, if men, combining the greatest practical skill with the highest scientific attainments, would give such an *undeniable security* to boilers, as to ensure them capable of bearing under the most unfavourable contingencies at least *six times* their working pressure."

It is, however, not strictly correct that there is a close analogy between cannon and boilers as Mr. Fairbairn thus assumes; for it should be remembered that a boiler is in a very different position with reference to its component parts, being made up of various pieces, compared with a piece of ordnance, which is throughout solid. Different questions, therefore, are involved while considering the capability of a boiler to resist strains. Formerly it used to be, and by many now it is still, believed that two plates riveted together were, and are, stronger at the riveted line, and this because in place of the strength of one plate there was apparently the strength of two. But more recent and carefully investigated experience has shown that this is not the case. It would be so if the union between the two plates was perfect, as in the case of welding; but not only is a riveted joint not complete in this sense, but the strength of each plate at the joint is reduced very materially by the parts cut or punched out for the rivet holes; so much so, that the united strength of the two is actually less than any other portion of the whole plate. Much depends of course upon the way in which the riveting is done; single riveting, thus ○ ○ ○ is not so strong by the proportion of 56 to 70, as double riveting, thus ○ ○ ○ ○ ○. That is, the

lines of rivets should form a series of triangles, not be in a straight line. Then, again, a boiler is placed in a position where the expansion of its parts is so unequal, that the rivets are gradually loosened by the disruption of the metal surrounding them. This may be easily understood, when we consider that in starting to fire a boiler, with cold water in it, the heat imparted to the under side of the plates exposed to the action of the fire is actually in some cases fifteen times greater than that on the upper side of the plates exposed to the water. The necessary result of this difference is the expansion of the lower side and the contraction of the upper sides of the plates. This leads to partial opening of the joints, so that leaking takes place, but which leaking takes up as the temperature of both sides of the plates is equalized. But unequal expansion and contraction is not confined merely to the surfaces of the plates, but different parts contract and expand unequally, according to their position relatively to the fire: the parts exposed to the fire directly will naturally be warmer than the parts near the chimney. The result of all this is, that unequal strains are produced, tending to weaken the plates, and this in the highest degree at the weakest parts of them, namely, at the line of rivets, tending either to

make the rivets give way, or to widen the rivet holes, and ultimately form cracks. From what we have said the reader will judge of the necessity there is for examining from time to time the condition of the plates at their rivet lines, particular attention being given to those parts, if any, as in the case of Cornish boilers, where angle irons are used. Another point which should be observed is, if you wish to clean out your boiler at any time, do not choose the time after you have been working it, and then to cool it quicker put cold water into it. Let it cool gradually.

At one time it was understood or believed that the boiler-plates, in virtue of their being rolled, were stronger in the direction of their length than in that of their breadth; but a careful experiment of Mr. Fairbairn's has shown that there is practically little difference between them, the difference (half-a-ton), such as it is, being in favour of the transverse. The position of the plates themselves, or rather the direction in which they are placed, does not, therefore, materially affect the strength of the boiler; so that they may be used in any direction thought proper. But, although the plates themselves are almost equally strong in any direction, still, when put up so as to form a cylindrical vessel, as a boiler, there is a weak and a strong way in which to do it. Thus the weakest of all ways is to make, as is usually done, the lines of rivets at right-angles to the length of the boiler: the strongest is, to make them diagonally. This method has been for long, and singularly, overlooked; but it is taken advantage of in the patented boiler of Mr. Wright, of Walsall, in Staffordshire. By the diagonal arrangement of the rivets, the whole of them assist in resisting the transverse or curvilinear strain, in place of the whole being thrown on the longitudinal joints, as in the common plan.

Mr. Fairbairn has recently pointed out the difference there is between the strength of a long flue and a short one. The longer the flue, the weaker it is. The plan he adopts to strengthen long flues, such as those used in common boilers, is to virtually shorten them, by dividing the length into three parts, and passing round, at these points, a ring or rib of double-angle iron, riveting each side of the angle to the plates. This plan is found to increase the strength of a flue most materially. In a boiler, the flue made with the usual lap-joint gave way under trial at a pressure of 97lbs. upon the square inch; but with the angle-iron ribs, it stood a pressure of 127lbs. to the square inch. In round numbers, the strength of flues will be increased by this plan threefold.

There is a very absurd mode adopted by boiler-makers, against the adoption of which we would strongly caution purchasers of boilers; and that is, having the boiler sold by weight, as if that alone decided its strength. A boiler may obviously weigh as much or more than another, and yet be made of the worst possible material, and be put together in the worst possible manner. The greatest strength with the least weight is, we take it, the point to be aimed at. Let the maker contract to provide the purchaser with a boiler to work a certain power of engine at a certain pressure; but—and the point is of the utmost importance to the purchaser—let the boiler be tested before delivery, and the test guaranteed, to a pressure from six to nine times the working pressure; and let the purchaser remember that the only true mode of testing is by hydraulic pressure.

We now come to consider the important subject of boiler explosion—the causes thereof, and remedies for prevention. All sorts of theories, and some of them sufficiently fanciful, if not absurdly conjectural, have been brought forward to account for boiler explosions, the causes of which are certainly mysterious enough, and calculated to baffle—as they often have baffled—the most strict and rigid investigation of the cause. But of all the theories advanced, the

most probable is that put forward by an eminent authority, and which is known as the "percussive" theory, and which is explained in the following:—

"An excess of steam pressure in proportion to the strength of the boiler is generally supposed sufficient to account for explosions, but I think this theory is incomplete. Simple steam pressure is exactly like water or air pressure. It may be gradually increased, until it becomes greater than the resisting powers of the vessel, when a rupture will take place, and the pressure be relieved: this will be comparatively harmless. How is it, then, that the same cause which produces simple rupture in some cases can occasion violent and disastrous explosions in other cases? The influence which the presence of water within the boiler has upon the character of an explosion is quite disregarded by most people; and if we consider this, I think we may discover a solution for this paradox. Water in a boiler under a heavy pressure is of a considerably high temperature, and minutely mixed up with steam; in fact, it might with propriety be called *liquid steam*. At 336lbs. pressure the water has a temperature of 428 degrees Fah.; and should the boiler give way above the water level at this pressure, more than simple rupture would ensue. The steam in the steam-chamber would be instantly liberated; and the steam pressure being thus relieved, a considerable quantity of the heated water would flash off into steam, which, following up the rupture, would, by its percussive force, completely rend the boiler, and project its parts with great violence. This need not excite surprise; for considering the great heat of the water and the impossibility of retaining it as water at a greater temperature than 212 degrees, we may form an idea of what a large amount of steam would be thus suddenly generated; and as the strength of iron to resist a gradual and a sudden pressure do not coincide, we may reasonably conclude that this steam, rising with great velocity, acts precisely in the same manner as the elastic gases generated in the firing of gunpowder do, when in a piece of ordnance where the lead has not been rammed home.

"That steam does act in this percussive manner has been clearly proved in practice. In Cornish engines, the impact or percussion of high-pressure steam suddenly admitted on the large pistons has been found to spring the cylinder covers. These were formerly stiffened by stout ribs dividing their upper sides into segmental cells; but as the cover was thereby deprived of all elasticity, it broke under the shock just mentioned; the form and arrangement of these ribs have been changed in consequence.

"I consider this theory the most probable of any yet advanced to account for the precise mode by which explosions are produced. It is simple, tangible, without mystery, and quite according to all the laws of physics."

We have already said that one cause of boiler explosion is the defective material of which boilers are composed, and of the defective way this is put together. The strongest form is assuredly the cylindrical; yet we see sometimes, in the case of flued boilers, elliptical-shaped flues inserted. We know of one patented boiler, highly puffed too as the strongest which can be made, in which there are several flues inserted, and all of them are elliptical. But on this point of construction we have already said enough, supplementing it here by merely remarking that Mr. Fairbairn has conclusively shown that flues should be *truly cylindrical*. We have therefore to refer to other causes which lead to the production of an excessive pressure of steam in the boiler, which as above pointed out is the chief cause of explosion. And, first as to the deficiency of water. In many cases the water supply, through defective working of the pumps, is so short that but a few inches is kept in the boiler. The result of this is that the sides of the boiler in contact with the flues get overheated, and when water is introduced the steam is

generated so rapidly that the safety valve cannot pass it off, and the boiler plates not being sufficiently strong to resist the pressure, the boiler bursts. It is worthy of remark that water passed on to the heated surface of a plate does not pass into the state of steam all at once. Boutigny showed that the water assumes spheroidal forms, which keep rolling to and fro, or dancing upon the surface of the plate; but as soon as the temperature of the plate is reduced to a certain point, the sphere of water is passed *immediately* into the condition of steam *with the rapidity of a flask of gunpowder*. From this the reader will see the increased danger arising to the boiler from this cause. If the steam was gradually—even although quickly—formed, the danger would not be so great as from this instantaneous increase of pressure; the resistance of the boiler plate to a gradual and to a sudden pressure not being equal, it being less capable to withstand the sudden pressure. Seeing, then, the danger arising from a deficiency of water, the reader will perceive the necessity of looking carefully to the action of the pump, so that it will really be working when one thinks it is. In portable engines, where the pump is generally closely attached to the boiler, a very ready way to test if it is in proper action, where it is pumping *cold* water, is to try it with the hand; if the surface of the pump is cold, or much colder than the boiler, you may be sure that water is passing through it; if it is hot, the reverse. In stationary engines, as the pump is not under similar circumstances, but is generally at a distance from the boiler, this test cannot be applied; the only way is to test its action by means of the *pet cock*, with which every pump *should* be—but unfortunately is not always—provided. A pet cock is a small tap applied to the pump, which, when opened, water is forced through it coincident with the strokes of the pump. This pet cock is therefore an index to the working of the pump; for if, on opening the pet cock, no water is forced through it, the pump is not working properly; that is, it is not passing water to the boiler. Attention, therefore, should be given to the pump to see that it really is working when it appears to be. A note on this subject will be given when we come to describe the management of the *engine*. But although a pump may act well, it can only act when the engine is at work; and, although the engine may be standing, the boiler may be still raising steam, passing it off by the safety valve, and the water may thus gradually get low. Many plans have therefore been introduced to supply the boilers with water at such times, in cases where a "donkey engine" for pumping is not used. The best out of sight of these contrivances is "Giffard's water injector," which, from the simplicity and efficiency of its action, is likely, we think, to supersede every other apparatus. It is totally independent of all other mechanism, and will inject water into the boiler so long as steam at any pressure exists in it. A deficient supply of water in the boiler not only brings about the likelihood of an explosion, in the manner above described, but is the cause of another evil, namely, the over heating of the plates left exposed, which, repeated often, is rapidly destructive of their strength.

But, while taking care to supply water to the boiler, it is essential for the user to know whether that supply has been given to it, and how much of it is given. These points are ascertained by various appliances, as "gauge cocks," water or glass gauge, and other forms of apparatus. To give immediate notice of a deficient supply of water in the boiler, we know of no apparatus so effective and simple as that known as Harley's water indicator. In this a copper float is suspended to the lower end of a hollow tube; the upper end of this tube is made conical, and passes into a correspondingly conical seat, a tube leading to a steam whistle. By means of an aperture

in the tube, steam is admitted to the inside of the float, so that the pressure inside and outside of it being equal, it floats upon the surface of the water when the level is at its proper height. But if the water level is lowered, the float falls with it, and the conical part at once falls from its seat and blows its whistle. Here the touching part is a mere point, so that nothing can exceed the delicacy and promptitude of the action of the apparatus.

In addition to the ordinary gauge cocks, every boiler should be supplied with a "water gauge." This appliance consists of a strong glass tube, fitted up at the front of the boiler, in such a position that while it is out of the reach of harm it is easily seen by the attendant. The upper end of the glass tube is fixed in the socket or pipe or tube, which is connected with and passes into the *steam* space of the boiler, the lower end being similarly connected with the *water* space. Both tubes are provided with stop cocks to prevent the water and steam passing out in the event of the glass tube being broken. The level of the water in the glass tube being the same as in the boiler, the exact condition of the water in the boiler can be *seen* at a glance. Glass gauges are generally fixed to the front of the boiler, near the fire box end. At this position, the water, being so immediately under the influence of the furnace, is so unsettled, that the indications of the gauge are not to be depended upon, more especially if the steam is taken to supply the engine from the fire box end. To obviate this cause of danger, it has been recommended to have the tubes from the gauge carried forward to the far end of the boiler, where the agitation of the water is least. The gauge-cocks are two cocks supplied with pipes which pass into the interior of the boiler; one terminating in the *steam* the other in the *water* space, or what should be the steam and water spaces. On turning the cocks one should therefore pass out steam, the other water; if both pass steam there is too little, if both water there is too much water in the boiler, and the working of the pump must be arranged accordingly. It is worthy of notice that gauge-cocks, however valuable in Cornish or egg-ended boilers, are not so valuable in tubular, where the pressure of the steam is considerable, and this from the fact that when the lower cock is opened, the water passed through it, from its contained heat, is set off into spray and steam, and, as the water in the boiler from the pressure of steam on its surface rises to any opening near its level, the upper cock will pass water out, even although its real or actual level is some inches below it. To obviate the evil thus arising in the use of gauge-cocks to tubular boilers, Mr. Gooch fixes a small brass tube to the boiler in the same way as the "glass gauge" is fitted, and to this tube the two "gauge-cocks" are attached. To the top of the *vertical* tube a tap or cock is fitted. In using this, open the two gauge-cocks, then close them, open the cock at the top of the *vertical* pipe to allow the steam to blow off, and on now opening the gauge-cocks the water issues from them quietly and indicative of its true level.

Another cause of explosions is the defective condition of the safety valve. This may, as it often does, *stick* in the seat; to prevent which, various forms of valves have been introduced. We know of none better than that invented by the celebrated James Nasmyth, of steam-hammer notoriety. In this the valve is spherical, and rests on a correspondingly curved seat; the stem of the valve goes down into the boiler, and is weighted there; but it is also provided with a flat piece of iron; this is acted upon by the water as it boils rapidly, and is kept moving from side to side. The motion is communicated with force sufficient to keep the spherical valve above moving in its seat continually; although not sufficiently to permit the steam to escape. Whenever the steam rises to a pressure above that due to the weight with which the valve is loaded, the spherical ball rises out of its seat, admitting the steam

to escape. Another great advantage possessed by this valve is, that the weight being placed in the interior of the valve, no tampering with it is permitted; the attendant cannot place weights in the valve itself, for it is covered with a spherical cap or cover, pierced with holes to admit of the steam's escape. The lever of a safety valve is also apt to stick or be jammed up at the joint through rust. The best way to obviate this cause of undue pressure is to have the joint to play between two brass washers, kept well lubricated. We have seen a lever so rusted in at the usual iron joint, that it took the force of a man to lift it. Let the joint, then, of the safety valve be well looked to. Safety valve spindles are often made to pass through glands, or stuffing boxes, in order to prevent the escape of the steam; but this is often the cause of accident, inasmuch as the spindle is made so tight that it sticks in the stuffing box. If glands and stuffing boxes are used at all, let care be taken to have them made so that plenty of play will be allowed to the spindle. A safety valve loaded to a certain weight shows only the pressure of the steam when it blows off; it is therefore no indication of the pressure at other times. A steam gauge should therefore be supplied to the boiler. The most commonly used form is Bourdon, or Smith's.

All safety valves should be so adjusted as to lift freely whenever the pressure exceeds the usual working pressure. If not so adjusted, and the steam cannot pass off till it has reached an unsafe pressure, the safety valve becomes only so in name, not in reality. It is also of importance to remember that the "steam pressure gauge" should be placed at or near the boiler, to show the pressure of the steam therein. It is often placed on the steam pipe near the engine, to the vibrating effect of which it is exposed, which rapidly spoils its internal mechanism, causing it to indicate wrongly. Again, so placed near the engine it does not show the pressure of the steam within the boiler, which is what is wanted. At the same time it should be kept from actual contact—by placing wood, for instance—from the boiler, the heat of which would affect their indication.

Another cause of boiler explosions is the confined water spaces which are sometimes met with in tubular boilers, and which cause a defective circulation. The ordinary circulation in a free space, of a heated fluid, is such, that hot particles of water and of steam are moving continually upward, while the colder particles are descending to take their place. Now where the flues or tubes of a boiler make confined spaces, motion is made difficult and the stagnation consequent is increased by the pressure of the steam above it. This steam above gets greatly overheated, and as soon as the equilibrium or stagnation is disturbed—as in portable engines by the movement of the engine at starting, or by opening of the safety-valve—the confined steam above rushes upwards, and relieves the steam below, which carrying with it fine particles of water, these are instantly converted into steam by mixing with the superheated steam above, and such an accumulation of steam is produced that the boiler is unable to withstand its pressure, and an explosion ensues. It is remarkable that explosions, especially of portable engines and locomotives, often take place just after starting the engine, when it has been standing for some time, or when the safety-valve has been opened. Explosions from this cause are much more likely to be frequent in multitubular than in egg-ended or Cornish boilers. But even in these two last, if the water is allowed to get very low, and the plates at the flues over-heated, and a great pressure of steam keeps down the water then if the safety-valve be opened, or other disturbance takes place, the equilibrium of the steam and water is disturbed, and a wave of the latter is likely to be thrown up on the heated plates, and an extra production of steam is the result. In all such cases, or where it is found they

may exist, as with a low condition of water and a high pressure of steam, the best and safest way is to draw the fire as rapidly as possible.

Another cause of boiler explosion is often found in the incrustation of the interior surfaces of the plates. The following remarks from the Report of the Manchester Steam Boiler Association will be of service:

"Some advance has been made during the past year in the prevention and removal of incrustation, although much yet remains to be done. It is too frequently concluded that incrustation and corrosion are not to be found in the same boiler, and that the plates beneath the scale are protected. Such, however, is by no means found to be universally the case, and frequently, on removing the scale, grooving, or other evidence of corrosion, is discovered on the surface of the plate beneath it. An inspection of a boiler, therefore, coated with incrustation, must always be unsatisfactory; not to mention the injury to the boiler itself, as well as the loss of heat that results from it.

"The remedy adopted for this evil, in marine boilers, namely, 'surface blowing-out,' has been during the past year frequently brought before the attention of the members, and a drawing made of a simple un-patented arrangement, and placed at their disposal. A very considerable number have availed themselves of this, while as many of the manufacturing engineers as have wished to do so have furnished themselves with copies. In consequence of this, several of these scum pipes have been applied: the exact number is not known, but one firm among others may be mentioned, who have fixed one of these scum pipes to each of their nine boilers, and with the most satisfactory results.

"This is not, however, the only description of scum pipe adopted. The subject of 'surface blowing-out' has been taken up by others, and two varieties of apparatus patented, and somewhat generally introduced. It is thought that this diversity will rather prove of advantage than otherwise; and now that the general principle of 'surface blowing-out' has been called attention to, the more individual ingenuity is directed to the details of the apparatus the better. A more minute reference to the construction of these scum pipes was made in the monthly abstract of October last; and now that these three classes have been in operation for some time, it is thought that the results of their working may shortly be made a matter of comparison, which, as soon as opportunity offers, will be communicated to the members.

"The use of soda, for the prevention of incrustation, is found of considerable advantage, and increasingly adopted. It is, however, better introduced in small regular doses, than in large infrequent charges. In many cases there might be fitted to the suction pipe of the feed pump a funnel mouth by means of which the requisite charge could be introduced to the boiler without difficulty; its rate of ingress being regulated by a tap between it and the suction pipe. In some cases a separate feed pump has been adopted, fitted with a small cistern containing a day's supply, and this arrangement has been found to work most satisfactorily.

"In conclusion, there are but few cases of incrustation which the use of soda, combined with regular blowing-out from the surface of the water, will not check."

The safety of a boiler fired externally depends greatly upon the mode of setting. The side flues are frequently brought up so high above the water level that the plates get overheated, and great danger thus arises. For boilers of small diameter the difficulty is to get free space, so that furnace builders are often driven to this bad practice. Where the boiler is of smaller diameter than three feet, the plan of setting up with outside flues should not be adopted. Externally-fired boilers are much more liable to

the parts exposed to the fire to become distorted and leaky by the irregular expansion and contraction, than internally-fired boilers. A very common cause of deterioration in the strength of boiler plates arises from the corroding effects of water coming in contact with them at the places where they rest upon brick-work. Boilers are sometimes set up with what is called a brick "mid-feather" running along the length of the boiler. Where this is adopted, any water leaking from the boiler itself, or trickling down the outside, settles between the boiler and the surface of the brickwork, and rapidly corrodes the plates. The danger is all the greater that it is not apparent, and often can only be known when too late. Corrosion to the extent of wearing away a boiler plate a quarter of an inch in thickness has been known to arise from this source. Where boilers are made to rest upon walls, the bearing surfaces should be as narrow as possible. *Leakage from the gauges or other points should always be traced, as it may be lodged at a point where corrosion may rapidly ensue.*

The following note, illustrated by fig. 21, on the setting of

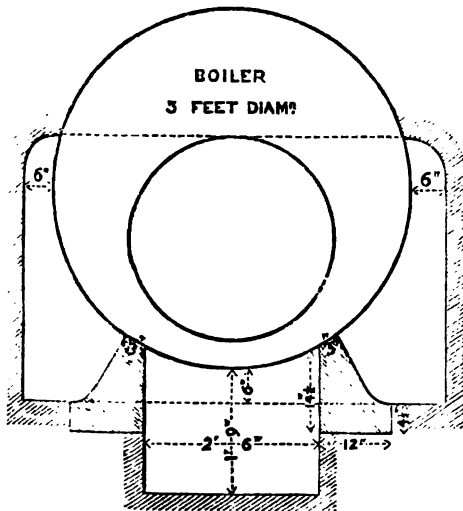


FIG. 21.

internally-fired boilers of 7, 6, and 5 feet diameter, is from the Report of the Manchester Steam Boiler Association:—

Mode of setting an internally fired Boiler of 7 feet diameter.—The boiler to be carried on two continuous side walls, spaced 4 feet apart in the clear between them. The top course of these walls on which the boiler rests to consist of fire-brick blocks, which can be obtained of any desired pattern, and should, in the present instance, be of the following dimensions:—Height on the vertical face, 12 inches; width on the base, 12 inches; width of bearing surface on which the boiler beds, 5 inches. The angle of this surface, in order to fit the circle of the boiler, should be 38 degrees above the horizontal; this will be best obtained by striking it out full size in accordance with the foregoing dimensions, which can readily be done by any competent bricksetter. The back of the blocks should slope down to a thickness of 4½ inches, so as to form an abutment against the brickwork at the bottom of the side flues, to prevent the weight of the boiler thrusting the blocks apart. The top of the side flues to be on a level with the furnace crowns, and the bottom on a level with the underside of the boiler. Their width at the top to be 6 inches, thus making a distance of 8 feet in the clear between the face of the side flues, which should not

follow the sweep of the boiler, as is frequently the case, but should run vertically from top to bottom, in order to form a pocket for deposit to lie in without covering any of the heating surface of the boiler, and at the same time to leave room for a man to pass along and examine the plates. The flue beneath the boiler will be formed by the side walls already referred to, spaced 4 feet apart; the height may be about 2 feet, but this is not very material so long as sufficient room is allowed for convenient access. The course of the flame, immediately after leaving the furnace tubes, to pass under the bottom of the boiler; to split at the front end, and return to the chimney through the two side flues. Generally two dampers are introduced, one to each side flue. It is important in boilers with two plain internal flue tubes that the course of the flame should pass under the bottom before entering the side flues, in order to promote circulation of the water, and to prevent straining the boiler at the transverse seams of rivets on its under side, and causing what is familiarly known as 'seam rending.' It is not equally necessary, though still advisable, to pass the flames under the bottom before entering the side flues of those boilers which are fitted with tubes or pockets for quickening the circulation of the water. In cases where the angle iron at the front end plate is external, the face of the brickwork should be set back some inches, so that the angle iron may be exposed to view, or leakage may take place without detection. The front cross wall underneath the boiler need not be more than 4½ inches thick, otherwise it is frequently found to harbour corrosion. This wall should be recessed so as to leave the blow-pipe entirely free, in order that it may be accessible to examination, not liable to be strained by settlement of the boiler, nor corrosion of the plates accelerated by contact with the brickwork should leakage occur. All the external flues should be faced with fire brick, and set in fire clay, no mortar being allowed to touch the boiler, especially below water line."

Mode of setting the 6 and 5 feet internally fired Boiler.—The general arrangement of flues should be the same as that given for a boiler of 7 feet diameter, and a slight alteration only made in detail to allow for the difference in size.

"For a boiler 6 feet in diameter, the side walls should be spaced 3 feet apart in the clear. The fire-brick blocks should be 12½ inches high on the vertical face, 12 inches wide on the base, and 4 inches upon the bearing surface upon which the boiler beds, the angle of this surface above the horizontal being 38 degrees, the other dimensions of these blocks remaining as before. The side flues to be carried down 8 inches below the level of the bottom of the boiler, and at the top to be on a level with the furnace crowns; this latter, as well as the remaining particulars, being the same as those for the boiler of 7 feet diameter.

"For a boiler of 5 feet in diameter, the side walls should be 2 feet 6 inches apart in the clear, the fire-brick blocks 14½ inches high on the vertical face, 12 inches wide at the base, and 3 inches wide upon the bearing surface upon which the boiler beds, the angle of this surface above the horizontal being 38 degrees. The other dimensions of these blocks remain unaltered from those given above. The side flues to be carried down 6 inches below the level of the bottom of the boiler, and at the top to be on a level with the furnace crowns, the remaining particulars being the same as those for the boiler of 7 feet diameter.

"For boilers of still smaller diameter, if a mid-feather be unavoidable, it should be faced with fire-brick blocks for the boiler to rest on, and the blocks bevelled off to a narrow bearing surface, since one of the causes of injury from mid-feather walls is their width. For a boiler of 4 feet diameter, the width upon the top edge need not

exceed 3 inches. The flues under all circumstances must be sufficiently large to admit of a man's passing right through them for the purpose of examination."

Boiler safety, then, depends in great measure upon the way in which all the points we have alluded to are attended to. Do not rest satisfied with thinking, or being told by your workman, that all things are right. Be sure you see that they *are* so. It takes a very conscientious man indeed to be trusted implicitly with the management of a boiler and its steam engine, and these conscientious men are not, unhappily, often to be met with. Moreover, if you are lucky enough to get hold of one, we believe the most rapid and sure way to change him to a care-

less fellow is to let him see that you leave everything to him. Poor human nature can rarely stand such a temptation as this, to neglect in time the work which should be done. Carefully inspect, or see that it is inspected—carefully inspect, then, from time to time, the condition of your boiler: it is of no use to have all the appliances to ensure safety, unless they are really put in use, and kept in such a condition that they can be used. Neglect of this common-place rule has resulted before now in loss of life and property. Steam is a good servant, but a bad master, and has wonderful powers of mischief in it. We have seen some farmers manage their boilers as if they were as harmless as "sucking doves."

THE BREEDING OF HORSES IN IRELAND.

DEPUTATION FROM THE ROYAL AGRICULTURAL SOCIETY TO THE LORD-LIEUTENANT.

Pursuant to appointment, a deputation in relation to this subject waited upon his Excellency the Lord-Lieutenant, at Dublin Castle. The following noblemen and gentlemen were present: Lord Crofton, Lord Clonbrock, Marquis of Drogheda, Lord Talbot de Malahide, Lord de Vesci, Lord St. Lawrence, Sir George Hodgson, Bart., Chairman of the Council of the Royal Agricultural Society; Sir John Power, Bart., Chairman of the Horse Committee; Col. Phillpotts, Royal Horse Artillery; Col. Hillier, Commandant Constabulary Depot; Gen. Hall, C.B.; Mr. R. M. Carden, Sir Percy Nugent, Bart.; Mr. Robert Browne, Curragh Ranger; Mr. Thomas R. Hardy, Capt. Colthurst Vesey, Mr. H. J. McFarlane, the Hon. Thomas Preston, and Mr. Robert Fowler.

Sir GEORGE HODGSON stated the objects which the deputation had in view, and the substance of the Report, as a result which must be expected to act with injurious effects upon the remounting of our cavalry and artillery, and also with regard to the farming classes of the population.

Lord DE VESCI, in reply to his Excellency, said that the sub-committee appointed to take evidence, after hearing all the facts that were communicated from all parts of Ireland, had also taken evidence which was afforded them by reports and letters written by several officers commanding regiments—from Col. Phillpotts, commanding the artillery; Col. Baker Col. Hillier, and others; and they all agreed in this important fact, that the breed of horses fit for remounts had so greatly deteriorated in this country, that they found it very difficult to get horses suited to their purposes. The committee, having learned these facts, and having had communications from all parts of Ireland, did not consider themselves competent to make any report to the Royal Agricultural Society as to what remedy should be adopted. There were several suggestions made with regard to sires, &c., to which there were many objections; but they had this startling fact laid before them, that in a few years, unless the evil could be remedied, it would be very difficult to find horses suited to the purpose of cavalry remounts. Having ascertained these facts, they felt it their bounden duty to lay the matter before the Government; and the council of the Royal Agricultural Society came to the unanimous decision that they should ask the Government, by means of a memorial to the Queen, to grant a royal commission to inquire into the subject. The reason they did not

recommend any particular mode to the Government was that they considered the Government would be in a much better position than they could be to obtain evidence on the subject, by taking in a more extensive field. They could ascertain the system adopted in France, Austria, and other countries, and also they could ascertain what was the system in India. The council, he believed, wished to have it stated to his Excellency, that in asking the royal commission they did not come to the Government to ask for any money with regard to the general breeding of horses in Ireland, because they considered that as far as the general breeding for their own requirements was concerned, that ought to be done by themselves; but they laid the report before Government, and if they agreed that the facts were startling they would then consider the subject, and ascertain how far a remedy could be afforded.

HIS EXCELLENCY: The representation is, of course, confined to Ireland.

Lord DE VESCI: Yes, to Ireland. He believed there was a decision come to by the council of the Royal Agricultural Society with regard to writing to the Royal Agricultural Societies of England and Scotland, to ascertain what was their opinion on the subject.

Lord TALBOT DE MALAHIDE said that all that was done with regard to the Royal Societies of England and Scotland was to write to the secretaries to ask for their co-operation.

HIS EXCELLENCY said he apprehended the complaint made by the committee existed very generally.

Lord CLONBROCK said that part of the subject had attracted attention in England. Foreign buyers came over and outbid the home buyers, and carried off the horses.

Lord DE VESCI said it was undoubtedly the fact that Ireland used to be the great nursery for the supply of horses; and if that supply were stopped, he apprehended that in case of war there would be great difficulty in remounting efficiently their cavalry and artillery.

Lord TALBOT DE MALAHIDE said they had very considerable evidence given before them, to the effect that a great portion of the sires in Ireland were unsound, and were, in fact, doing an immensity of mischief in the country, which was in itself a very serious evil. Another point which had been brought before the committee was one which the Government could give considerable assistance in, if they occurred in that view of the case. The best judges were decidedly of

opinion that the present arrangements with regard to the Queen's plates were detrimental to the breed of horses, and that the general system of handicapping had a very considerable effect in deteriorating the breed of weight-carrying horses.

Sir JOHN POWER said that in England they had the means of procuring sires by private enterprise, but in Ireland they had not the same opportunity now as they had had heretofore; and the sources were nearly dried up.

Mr. BROWN, Curragh Ranger, said that the sources in this country, as had been stated by Sir John Power, were really dried up. He remembered when breeding establishments extended almost over the country. Gentlemen then kept large studs for the benefit of their tenantry, and had good stud-grooms; but without proper management they would never do. The gentry of the country did not look at the matter now as a pursuit as they did before, and it had departed from the resident nobility and gentry, and gone into other hands, who were not so competent as they were formerly, and, in his opinion, there was not the slightest chance of having the breed of horses regenerated in Ireland by private enterprise or public companies. There was not a Queen's plate horse now in the country fit to be a sire. The only two that he could recommend were two English horses which merely remained here for a season, and he could not therefore look to any regeneration arising among themselves. So far back as 1477, among the Irish kings, there were kinds of games established at the Curragh called the Olympian games, to encourage the breed of horses. The best horse that ever ran, Fangh a Ballagh, was bred on the borders of the Curragh, and he believed he was a better horse than Eelipes, and Admiral Reus said in his letter that the soil of Ireland was peculiarly adapted to the breeding of horses.

Colonel PHILLPOTTS, in reply to his Excellency, said he quite agreed with what Lord De Vesci had stated with regard to the artillery remounts. There was great difficulty now in procuring them; and, in the event of a war, they would probably find themselves in a fix.

Mr. M'FARLANE said they had calculated the other day that a difference of £5 in the price of each horse would make a difference of three millions sterling in the value of horses in the country; but it was in the course of investigating the subject that they saw the bearing of the question in a military point of view, and that in case of war they should be in a very great difficulty. The information which the committee had received was perfectly in accordance with Mr. Donnelly's statistics, which showed that there were one-fourth fewer

foals in the country than there were in the previous year. He happened to have had some considerable experience at the time of the crisis in India; and it was considered that horses could be taken over with more advantage from this country, and be sooner placed on the field, than if they were procured from the Cape of Good Hope and other places. It would be much more advantageous to the country to breed strong horses than to breed light ones. The class of mares suited to the breeding of artillery horses was the very class of mares that the Agricultural Society encouraged the farmers to keep, and it would be very important if the farmers could get good sires.

Sir PERCY NUGENT said there was another point to which he wished to direct attention. There had been a change since the Crimean war in purchasing horses for military purposes. Now, they were only purchased at four years old, whereas heretofore they were purchased at three years old; and thus the farmer was enabled to feed his horses better, because he had to keep them an extra year.

Colonel HILLIER said the four-year-old horse was more quickly trained, and fit for service in a shorter time, than three-year-olds; but extremely bad remounts had been sent out to the Crimean war, and many of them, he believed, never carried a dragoon.

HIS EXCELLENCY: My lords and gentlemen, I think it due to such a very influential and imposing deputation as this, to invite the attention of the Government to the representations they have made. It does not appertain to me to enter into any misgivings that I may have relative to the success of the application, because I think the object is one worthy of attention, and of considerable importance. I should think the military question is the only *locus standi* we have, and to which the attention of the Government should be directed. The other portions of the question relate to private profit, and the Government would hardly interfere with it. It might be felt that the information already received was sufficient; but there is no necessity to inquire into that, and I don't know whether it will be felt. I shall think it my duty to invite the attention of the Government to the subject, although I am at a loss to think what part of the Government I should communicate with; but I think the Secretary for War would be the proper party.

The deputation then withdrew.

[It has been determined to hold a Horse Show in Dublin during the spring, but, as we hear, with only £800 to be offered in premiums!]

AGRICULTURAL EDUCATIONAL COURSE.

EXAMPLE II.

LEVELLING.—THE INTERSECTION OF PLANES OF THE ANCIENT GEOMETERS.

In agriculture the term *levelling* has a twofold significance. First, it means the work of filling up furrows, hollows, or pits in the land with the earth removed from elevated ridges, or other places, so as to make an even surface. Secondly, it is the art of taking the inclination of the waterfurrows, drains, &c., in water-furrowing, draining, irrigation, warping, embanking, road making, and building. The former of these is the legitimate meaning of the word, the latter being evidently

a misnomer. At the same time it (the latter) has acquired in this perverted sense, from long use, a currency of acceptation, which we shall not on the present occasion attempt to gainsay. When the sportsman *levels* his gun, it matters not whether he aims at a bird on wing at an angle of some 45 degs. above him, or at a hare in the ravine below, at an angle as far below the level of the ground on which he stands, for in both cases, in sporting phrase, the gun is said to be levelled, *i. e.*, the

line of collimation or sight is directed to the object, whatever may be the angle it makes with the horizon, or any other horizontal or vertical line. So is it in levelling, for the line of collimation or sight is directed to the object.

Thus words acquire a double signification, which is always easily understood, according as they are applied to this or that purpose. Still it must be confessed that the old phraseology was more correct, scientific, and practical in its meaning, and hence preferable.

It is to this latter sense of the term *levelling* that we intend confining our observations at the present time, and more in the light of an educational question than in that of a purely practical one. The object we have in view is to show that this is a branch of geometry which every farmer ought to learn, because when applied it is a leading, if not the fundamental one in farm practice, with which all intelligent and well-educated farmers are familiar, even although they may not have crossed *pons asinorum* at a university, or hold a diploma of a Royal Agricultural Society.

WATERFURROWING.—It is now nearly forty years since the writer was first taught by his father, a practical farmer, how to find the level for a waterfurrow across the ridges of a comparatively level low-lying field, with an instrument—a spirit-level, on the top of a narrow thistle spade or staff. The instrument thus served various purposes. In ordinary occasions it was a farmer's pike staff; but should a thistle in spring or summer time show its nose above ground its pride was humbled forthwith by a deep-slanting hit at its tap-root with the instrument. Should a level require to be taken, the staff was firmly put into the ground: the spirit-level was next taken out of the pocket, the handle of the staff screwed off, and put into the place from whence the spirit-level was taken. The level was then screwed on to the top of the staff and adjusted, until the bubble stood in the middle, when we were called upon to look through the sights on the top of the level to a cross-staff placed at the farther end. A question of difference arose with a younger brother as to who should have the first "peep"—one that was soon decided, on the plea that "turn about is fair play." The two sights consisted of two small brass plates, one at each end, rising a short distance above the surface of the level. In one a very small hole was drilled. This was the eye-sight, or the one to which the eye was placed. The other was a transverse longitudinal opening, of about an eighth of an inch in depth and three-fourths of an inch in length, in the middle of which opening a fine wire was stretched across. The level was placed at the highest ground, and a cross-staff, with a small slip of writing-paper round it, was set up at the lower ground, and when the upper edge of the slip of paper was brought into the line of collimation, *i. e.*, when the small drilled hole, the fine wire, and the edge of the slip of paper were in a line—"the level of the ground was taken," the difference between the height of the small drilled hole above the ground at the one end and the edge of the paper above the ground at the other being the fall.

Practically applied, the old waterfurrow used to be opened in a serpentine direction, on nearly a dead level, and the problem was to open a new cut, or covered drain, right across to a lower point in the rivulet, so as to get a greater fall; and being at the time school-boys learning land-surveying, we had to measure the new cut with the chain, and give in a plan and section, with a specification as to what it would cost at so much per yard if finished a covered stone sewer, and then set the three cross-staves for the drainer to commence work.

Of course, to us beginners the problem was a poser. Herodotus and other historians tell us that when Moses (the Mizraim of Scripture) took possession of Egypt, he turned the river Nile into a new channel; and perhaps it gave the geometers in his time less trouble to take the levels and give in a plan and section, as they must have done, than it gave us. But be this as it may, the practical lesson to which we wish to turn is briefly this: Unless farmers thus teach their boys how to apply the elementary education they receive at schools and colleges, where field practice is not taught, the upshot in nine cases out of ten will be wasted time and disappointment.

Good hands, accustomed to water furrowing, acquire from experience a pretty correct knowledge of the levels, simply by casting the eye across the land. Before thorough drainage was generally adopted, we knew large districts of land reclaimed from rivers and the sea, where the fields were so level that the only fall was the greater depth of the ditches and water-furrows at the one end or side of the field than at the other, and when, in the winter season, a hand to every three or four ploughs was required, to keep the cross-furrows open during the operation of ploughing; otherwise a heavy shower would have flooded the whole lands, and thus have prevented the teams entering the field. In such cases the maxim is to prevent stagnant water, which is always the test of the accuracy of the levels. But having had considerable experience in farming such soils, we found a great benefit from the use of instruments, *viz.*, a level and three or more cross staves, in controlling the water-furrowing of the land, as it gives the total fall in a moment, when a regular inclined plane can then be opened without deviating an eighth of an inch from the true bottom line throughout the whole length of the furrow, and which should always, as far as possible, be done in dry weather in autumn, or before the wet weather breaks loose, in getting in either winter or spring wheat, when there is no water to test the levels, and when the lands cannot be entered to correct mistakes without doing an infinite amount of harm.

DRAINAGE LEVELLING.—In the draining of land (including rivers, open ditches, and covered drains, as the common underground system of pipe-drains) the operation of taking the levels, or of finding the total fall and general inclination of the current, is the same as in water-furrowing already noticed. This branch of agriculture, *viz.*, the drainage of land, has now become a distinct profession, and a very important one it is. Indeed, it was so under the Chaldeans, Egyptians, and other oriental nations of the East, in patriarchal times, when the valleys of the Tigris, Euphrates, Nile, &c., supported a population manifold greater than what they now do, as when they were visited by the historian Herodotus, who records the elevated position which those engaged in the control of this branch of farming professionally occupied in society under the caste system of subdivided labour which then existed in all those countries, and which still exists in India. At that time, however, the employment not only embraced the drainage of land, but also its irrigation, warping, caussalling, and, in short, everything connected with water; and we aver it might probably do so at the present time, with all the improvements which modern discovery in science or ancient practice conjointly may suggest.

It would take more than a whole article to do anything like justice to the practice of levelling as carried out in this branch of agriculture in ancient and modern times, including an account of the levelling instruments employed. We say therefore (circumstances permitting) return to this division of

our subject, and give a detailed account of the three methods of levelling now practised, in order to point out the fallacious principles on which two of them are founded, and the errors to which they give rise in practice, as well as to show the sound bases upon which the other is founded. At present we shall merely enumerate the three methods, confining our remarks to the correct one.

First method.—This is the practice already taught under "water-furrowing." It is done by various instruments, and is technically known under different designations; but in each case the same elementary principles are carried out, and these principles are those taught in "Euclid's Elements of Geometry," and which were carried out into practice long before Euclid's time in the great drainage, irrigation, warping, and canalling works of Chaldea, Judæa, Egypt, &c., some of which works exist to the present day, bearing ample evidence to the facts of the case to which attention is thus briefly turned. In point of fact it is the only method which can be successfully practised in the execution of large works, such as those alluded to in the valleys of the Tigris, Euphrates, and Nile.

The instruments used are known as "water-levels," "spirit-levels," "mason's levels," "quadrant-levels," and a host of patent telescopic and other levels too numerous to mention.

In principle it is designated the "single tangent method," or "back sight method;" sometimes "foresight method;" or "one sight method," "the angle of depression method," &c. Thus, by way of practical illustration, if the eye is directed at right angles across a plumb-line, held in the hand, to the top of a cross staff, then the line of sight is a tangent to the plumb-line; now, if this line at the eye is three feet from the ground, and at the cross staff six feet, then the fall between the two stations (the higher ground and the lower) is three feet; and this result would be arrived at with equal accuracy by any or all of the above instruments, only in the case of the mason's level the eye has to be directed over the top of a "straight-edge" or "rule," otherwise the result would be erroneous, as in the next two cases, for were the circumference of the globe levelled with a mason's level, the levels would form the sides of a circumscribed polygon.

Second Method.—This unfortunately is the method of levelling two commonly taught in the majority of modern school books, and very extensively, if not generally practised in railway levelling. It can be performed by any of the above instruments, and is known as the "double tangent method," or more commonly, "the back and foresight method." It is attended with a formal routine easily taught in schools, and gone through in the field; but the result is erroneous, consequently it has to be thrown aside when accuracy is required. As we intend giving an article on the elementary principles taught by Euclid, we shall in it show the fallacious principles, if we may so speak, upon which it is founded. Meantime we have only to observe that the levelling instrument is placed halfway between two levelling staves, so that the line of sight is directed to both. On the top of a hill it is thus correct, because the plumb-line is in that isolated position a common radius to the two tangents, one on either side down hill, as under the first method. On this account it has been nicknamed "the hill-top-system." But in going up or down hill it is otherwise, for there we have one tangent to two radii, and only one secant, the plumb-line at the level and the levelling staff in the highest ground being the two normals representing the two radii, and the lowest

levelling staff, the other normal representing the secant, which is contrary to fact or geometrical truth.

Third method; *To continue a given angle of inclination.*—In embanking and excavating, bevelling levels have long been used for determining the proper and uniform slope of the embankment and cutting; and, with a view to carrying out the same theory, draining levels, of varied construction, for determining the proper and uniform inclination of the bottom of the drain or river, have also been invented, and extensively used. But, like the mason's level, the moment you shift them to a second position, they indicate, not a continuation of the first level or line of inclination, but a new one: hence the fallacy. And, besides this error in principle, it is impossible in practice thus to continue a true line of inclination in the bottom of a drain, ditch, or river, either in clayey, sandy, or gravelly soils owing to the bottom in the former two swelling up by the reduction of weight on pressure above, and upward action of the water below, and particles of gravel getting below the instrument at every shift in some way or other, so as to destroy its adjustment. Either of these two objections is fatal to the practical utility of this class of instruments, and to the method of levelling they teach, in all cases where the levelness of the land is such that the fall or inclination requires to be taken with the greatest degree of accuracy possible.

The first, or old method of levelling, is therefore the only true one which draining engineers and farmers should continue to practise. Where fields have plenty of fall, and a uniform inclination, it is seldom that much levelling is required with instruments; but, in many cases, such fields are the exception; while almost in every field it is desirable to know the actual fall of some of the main drains, in order to determine their capacity for discharging water, size of pipes, &c., which can only be done with an instrument, and then worked out with three or more cross staves, as already directed, the tops of the three or more staves being kept in the same inclined plane. If the surface of a field lies in one hypotenusal plane, the finding of its drainage levels is a simple problem; but such is the exception; and when every drain involves a series of planes, then each case must be its own rule, so that the practical solution of the problem is attended with a greater degree of professional skill and labour than is generally credited by opinionative observers.

IRRIGATION; WATER-POWER; WATER TO FARM HOME-STEADS, FIELDS, &c.; LIQUID MANURING, &c.—In examples of this class, the same method of levelling is practised; and we may here observe that we have known practical farmers bring water to their homesteads for thrashing when their landlords and land-surveyors declared it impracticable, simply because the former took the levels on sound principles. All our limited space will allow us to say under this head is, that it embraces a wide field of improvement; for much may be done in bringing clean water to cattle, and in throwing the dirty water upon the land.

In making canals, and in building, the levels are what are termed "dead-levels." They rather involve practical questions for the landlord than his tenants. At the same time, field-gates require looking after; for, if allowed to get off the level, they will soon knock themselves to pieces; and if the farmer has a spirit-level in his pocket, while such are being put to right in spring time, before the cattle enter, its use is always preferable to the eye, and may soon save

its own cost in keeping down the carpenter account, if there are many gates upon the farm.

ROADMAKING involves levelling in both senses of the word. Thus, if the natural fall on one hundred yards is found to be three feet, then, if a cut is made one foot deep at the levelling instrument, and the excavated material be wheeled on to the lower ground, so as to raise the cross staff there one foot, it will reduce the inclination of the road to one foot per one hundred yards, without materially

interfering with the economical working of the steam plough tackle, which will be a decided gain to the steam horse at traction work, and no loss to horse teams, so long as they are employed in carting out the manure and home the produce of the land. The ground between the stone or concrete trams or rails, through fields, may, in many cases, be cultivated; so that an inch of land would not be lost in harvest time. In short far more can be done than we can describe in a concluding paragraph. KRONKA.

STATISTICAL STUDIES.

No. I.

IMPORTS OF WHEAT.

The importation of wheat, which had attained in 1862 almost fabulous dimensions, materially subsided last year, having fallen at least 40 per cent., although the receipts were still very considerable. This will be seen by the annexed statement of the importation year by year since 1844:—

FIRST TEN YEARS.		SECOND TEN YEARS.	
Year.	Qrs.	Year.	Qrs.
1844	1,099,077	1854	3,431,227
1845	871,710	1855	2,667,702
1846	1,432,591	1856	4,072,833
1847	2,556,455	1857	3,437,957
1848	2,580,959	1858	4,241,719
1849	3,845,378	1859	4,000,922
1850	3,788,995	1860	5,880,958
1851	3,812,008	1861	6,912,815
1852	3,060,268	1862	9,469,270
1853	4,915,430	1863	5,622,501

It is impossible not to regard these figures without amazement; for, while in the first ten years we imported 28,012,871 qrs. of wheat, we received in the second ten years the immense quantity of 49,787,944 qrs. (which at £2 per qr. would not leave much change out of £100,000,000!), showing an increased consumption of foreign wheat in the second decade over the first of no less than 21,725,073 qrs., or 2,172,507 qrs. annually. When the advocates of free trade consented in 1846 to the imposition of what they doubtless considered the merely nominal duty of 1s. per qr., they probably did not fully estimate the respectable sums which would be thereby obtained by the Exchequer, and which have amounted in the last 14 years to an aggregate of £1,268,227, made up as follows:—

Year.	Duty.	Year.	Duty.
1850	£186,949	1857	£171,898
1851	190,600	1858	212,086
1852	153,018	1859	200,046
1853	245,771	1860	294,048
1854	171,561	1861	345,641
1855	133,385	1862	473,463
1856	203,641	1863	281,125

The 1s. per qr. levied upon wheat now produces in fact at least one-third the amount obtained by the Exchequer under the old sliding scale. It is worthy of note that a much lower average price tempted in 1863 larger imports of foreign wheat than in 1853. In that year the average approached 53s. per qr., and yet but 4,915,430 qrs. of foreign wheat came to hand; while last year when, with a lifeless trade, the average was scarcely ever carried beyond 40s. per qr., 5,622,531 qrs. were received. This points to one or other of two conclusions—either that the impulse which the imports received from the bad English and French harvests of 1860 and 1861 did not wholly expend its force in 1862 but continued to exert an influence in 1863, or, what is more probable, that the production in Russia, Prussia, the United States, &c., has so greatly increased of late years, that it answers the purpose to sell in England even at a lower rate rather than not to sell at all.

That there is some force in this latter remark will be seen by the progress of the deliveries from Russia during the last 20 years:—

Year.	Qrs.	Year.	Qrs.
1844	104,524	1854	806,839
1845	53,768	1855	—
1846	304,839	1856	759,459
1847	843,143	1857	706,375
1848	522,457	1858	612,217
1849	598,812	1859	684,400
1850	658,288	1860	1,301,146
1851	699,172	1861	1,041,461
1852	733,571	1862	1,337,136
1853	1,070,901	1863	1,046,370

The deliveries last year were somewhat curtailed; nevertheless—although they sustained a rude temporary shock from the Crimean war of 1854-5-6—they have displayed a great tendency to increase, and probably if the Russian empire was in a more tranquil and satisfactory state, socially, financially, and politically, the strides made would be still more rapid. Let the steam plough once get to work, and the great plains of Southern Russia must pour an immense quantity of cereal upon the European markets; and the progress already effected in the past affords some guarantee as to the future. The stimulus which the free trade English legislation of 1846 has given to Russian agriculture is reflected in the fact that while in 1847, with prices at a point which for six months of the year (and five of those the most favourable for navigation) rendered wheat admissible into the British ports free of duty, we received 843,143 qrs. of Russian wheat, the low prices of 1863 still induced deliveries to the extent of 1,046,373 qrs.

Prussia, again, now sends us very large supplies of wheat, having virtually doubled her deliveries in the last 20 years. Thus:—

Year.	Qrs.	Year.	Qrs.
1844	550,794	1854	672,842
1845	423,743	1855	536,125
1846	359,891	1856	222,631
1847	490,435	1857	866,311
1848	522,049	1858	625,978
1849	614,906	1859	771,713
1850	832,731	1860	1,149,532
1851	696,175	1861	1,027,733
1852	451,938	1862	1,430,484
1853	1,144,702	1863	1,017,007

Egypt, too, has very largely expanded her deliveries of wheat into the English market, as will be seen by the annexed figures:—

Year.	Qrs.	Year.	Qrs.
1844	26,564	1854	302,935
1845	1,187	1855	437,211
1846	7,832	1856	534,603
1847	120,811	1857	204,231
1848	17,158	1858	464,441
1849	128,273	1859	377,199
1850	247,235	1860	197,265
1851	533,191	1861	339,311
1852	392,746	1862	759,035
1853	357,903	1863	535,290

It may indeed be said that up to the introduction of free trade measures, the importation of Egyptian wheat was practically unknown, while now—although the movement is of a rather chequered character—the business done under this head has attained very considerable dimensions.

The next important source of supply is the American Republic, which, although woefully disorganised at home, still contrives to maintain very extended foreign relations. The receipts of wheat from this quarter will be seen by the following comparative figures to have very largely increased:—

Year.	Qrs.	Year.	Qrs.
1844	2,421	1854	417,607
1845	23,339	1855	243,906
1846	171,155	1856	1,379,150
1847	423,819	1857	650,754
1848	78,184	1858	594,644
1849	108,142	1859	36,906
1850	100,699	1860	1,499,388
1851	202,486	1861	2,507,744
1852	483,569	1862	3,724,770
1853	718,182	1863	2,008,708

In the enormous deliveries made during the three last years, Brether Jonathan must have found most valuable resources to enable him to bear up against the evil fortune which has of late assailed his extraordinary territories; and the fact that with wheat at 40s. per qr. in 1863, 2,008,708 qrs. of American should, nevertheless, have reached our shores, proves how strong during the pressure of difficulties is the attraction of the perhaps once lightly esteemed British sovereign.

Lastly, let us mark the progress of the deliveries of British America, which, a part of the world with great natural resources, has hitherto made but a slow advance in wealth and civilization:—

Year.	Qrs.	Year.	Qrs.
1844	36,123	1854	18,150
1845	38,612	1855	14,570
1846	68,424	1856	111,819
1847	88,906	1857	114,798
1848	27,120	1858	100,821
1849	10,298	1859	6,721
1850	8,774	1860	183,422
1851	21,634	1861	549,525
1852	34,534	1862	861,452
1853	84,571	1863	483,230

The course of the Anglo-Canadian wheat trade has, it will be seen, been extremely chequered, and it is only within the last three years that anything like a solid advance has been made. It is possible, however, that having once opened up a considerable cereal trade with the mother country, the Canadas may show an inclination to follow this new current of business in future years with more zest than they had previously displayed.

We have now briefly summarised the principal features of our wheat imports. On the whole, the adoption of the free-trade system in 1846 must be admitted to have produced very great results, greater perhaps than some farmers, who are selling wheat at present prices, may exactly like. It is only within the last four years that we have felt the full force of the policy of 1846, and we must leave the next four years to decide whether this has arisen or not from exceptional circumstances. At any rate, with free trade, it may be confidently stated that our food supplies have in one most important particular been placed on a very solid basis; and it must go hard indeed with all the corn-producers of the world, before anything approaching famine ever again prevails in the British Isles.

THE CULTIVATION OF FLAX.

A meeting of the nobility, gentry, and farmers, surrounding Carnick-on-Suir, was recently held in the Town-hall, the object being to promote, if desirable, the growth of flax in that locality. The Earl of Bessborough in the chair. Dr. O'Ryan was appointed Secretary to the meeting.

The CHAIRMAN, after having returned thanks for the honour done him by his being called upon to take the chair, said—Gentlemen, I think it right to state to you what the objects of the present meeting are. I can do it but very imperfectly, as I came here, like most of yourselves, to learn, not to teach, and am very little acquainted with the subject of flax altogether. But the great object of the meeting I take to be simply this:—It is very well known that very great prosperity exists in the greater portion of the north of Ireland, and that it may be attributed in a very great degree to the growth of flax, which, from the existence of manufactures in that district, finds a ready market, employs a large number of people, and yields a considerable profit to the growers of the material. Great difficulties have existed in this part of Ireland, hitherto, to the cultivation of flax, both from the difficulty of getting it sown and manufactured, and also the great difficulty there is in finding a market for it. From the experience we had of the crop about 14 or 15 years ago, when great difficulty was found in disposing of it, I think there is a feeling on the part of most holders of land against its growth. Now, I understand, there are gentlemen present to-day who will explain to us more fully the system of its growth and proper management (Hear), and also some propositions will, I understand, be submitted on the part of Messrs. Malcomson, that you would do well to consider; and if it can be so managed that flax can be grown in a way not to be injurious to the land, and at the same time, be productive of benefit to the grower, there can be no doubt that from the great amount of labour that can thus be expended, great advantage will accrue to the labouring population from its being grown in the district (Hear). As I said before I have had very little experience in the question of flax—I grew it to a certain extent in the year 1848, but the circumstances under

which it was cultivated then were very unfavourable. Now, however, circumstances are so much changed for the better, it would appear a great improvement may be made in its management and growth, and I am sure I shall be very happy in any way I can to assist in any project which may be brought forward, that has for its object the improving and increasing the prosperity of this part of Ireland (Hear, hear). I will now ask Mr. William Malcomson, a gentleman thoroughly acquainted with the subject, to give you the benefit of his information. I am sure he will be properly received by you (applause).

Mr. Wm. MALCOMSON—My lord and gentlemen, it was a pleasure to me to have noticed in the newspapers of this week that a meeting was held in Cork to discuss and confer upon the same subject which brings us here to-day, namely, the growth of flax in the South of Ireland (Hear), and that that meeting was addressed by a class—landlords—who I find evince the greatest interest in the proceedings of this meeting. But, my lord, I do not say that landlords only are to benefit by this, rather I believe the farmers, the traders, and the manufacturers of the country will benefit largely if flax be grown to profit in this country. The traders, because anything that benefits the farmers must result in benefit to them; and the manufacturers, because when the material is furnished them at the very door it affords them local advantages over those who have to draw it from distant places (Hear). Your lordship, in the observations you made, referred to our firm. Now, I do not wish to be understood as bringing forward this question, or supporting it in any way, or with any other view than as one who is anxious to promote the interests of the locality in which we all reside (Hear), and to benefit the farming class whose success we would all be glad to see increasing from year to year (Hear, hear). Convinced that great advantage can be secured to the farming and manufacturing classes if the growth of flax is encouraged in this country, I come forward here as a simple individual, anxious to promote one common object with so much of the respectability of the locality as I see around me. I

have come to the conclusion that I have with regard to the prospects and probabilities of flax being a remunerative crop to the farmer, from the circumstances of the times in which we live, and from the certainty of an increased price for the raw material, if the war, which has unfortunately lasted so much longer than we expected, in America, should continue, as we have at present reason to believe it will, for a long time. But, my lord, it is not necessary that anyone who tries the growth of flax should be bound to produce it longer than the circumstances which make it favourable to grow continue to exist (Hear, hear). That those circumstances are likely to continue to exist we think is probable, and that the time is opportune, and that it is desirable that everyone who can induce the farmers to grow a certain amount of flax, in proper rotation, is conferring a benefit upon the country generally (Hear, hear). I propose, my lord, to circulate in a small way some statistics on this subject, for the information of such as may be inclined to give the crop a trial (Hear). With regard to the probable gross produce and probable profit which may be expected from the growth of flax, if I were to lay before you and this meeting the enormous profits which some growers of it have attained in the north of Ireland, during the last two or three years, I should be exciting prospects of profit which may be disappointing, and which are most undesirable to hold forth to the farming community. The statistics I hold in my hand show the result of crops grown in the county Tipperary during last year (a gentleman is present who, from his own experience and the experience of his tenants, can confirm my statement), and, making full allowance for contingencies, they show a net profit of £14 per Irish acre for an average crop (Hear). I don't think flax has attained to that price which it is likely to reach if the American war continues. The price of manufactured linen goods has increased, some of them fifty, and some to still higher percentage in their value; but the raw material—flax—has not increased in the same proportion. The reason of that is this: the power of consumption in the north of Ireland has not increased, while 30,000 acres of flax have been grown this year more than the average of many preceding years. This 30,000 acres is only one-fourth more than the average production before; and you can all understand that where an article is in increased supply, the consumer will not give a higher price until scarcity of the article will compel him; the price will advance until a fair proportion of its profits will be absorbed in his advanced price. The chief objection to growing flax in this district appears to be that the farmers have no means of scutching it and preparing it for market. That there is no market for it I don't at all fear; for when any article is produced in a marketable state, the facilities of transit to the north of Ireland or to England make the cost of transport very insignificant compared with the cost of the article. But it is necessary some combination of interests should be made by which scutching machinery should be available in the localities in which flax is grown, and with this object I would submit to your lordship's consideration, and that of the meeting, whether there is not that desire in the locality, amongst those who have the means to subscribe, for the formation of a small limited liability company, the whole capital of which I would propose to fix at £1,000, in shares of £10 each. Now, from the information I have gathered on the subject, I am aware there are scutching machines to be purchased at the small cost of £25 each, and four of these could be rented from the company by any owner of mill power; and I know there are several through the country who have small grist mills. From the calculation which Mr. Fennell has furnished me with, this £100 worth of scutching machines will be sufficient, working six months in the year, to scutch over 60 or 70 acres of flax. That is as large a quantity as we can expect the local machinery to be required for at present; and I think in that way we can meet the only pressing want which has been raised as an objection to the growth of flax in any locality (Hear, hear). Mr. Fennell is present, and will be glad to answer any questions, as far as his information goes, that may be proposed to him upon the growth of flax, the scutching of it, and the price to be had for it in the south of Ireland (Hear).

Dr. MARTIN said, one difficulty they had to meet was the dislike of the farmers to grow the crop, and that was a difficulty to be met by fair argument, conversation, and intercourse (Hear); and it was with this view he had promoted this meeting, acting as one of the committee for the promotion of

manufactures in Ireland. One of the great arguments used by the farmers against the crop was that they had grown it in 1847 and 1848, and were sadly disappointed by it. Well, what were the causes of that failure? There was a perfect epidemic for the growth of flax then in the country, created by the idea of an improved plan of manufacturing flax without the necessity of having recourse to scutching machinery (Hear, hear). It turned out that that "retting" did not answer, and so the flax was left on the farmer's hands, and great disappointment was felt by them (Hear, hear). Then there was the difficulty in the use of scutching mills that it required skilled labour, which was not to be had then; but, by adopting the new description of machine referred to by Mr. Malcomson, the mode of managing it could be taught in a few days (Hear). As a proof of the importance of this movement, and that it claimed the warmest attention, he mentioned the following fact:—In the province of Ulster, last year, the flax grown was worth £4,000,000 to the farmers. When that crop was worked into fabrics within the province, it became worth, altogether, £33,000,000 (Hear). The growth of flax in the other three provinces together was worth only £135,000 to the farmers, and, not being turned into fabrics in those provinces, remained only worth that sum to the provinces. The population of Ulster was only two millions, while the population of the other three provinces amounted to four millions. He regarded the movement as important in a national, social, and private point of view. Socially, it was so, because it provided means of employment for the families of small farmers, and involved the retention of the small farm system in Ireland, which he believed thoroughly essential to the prosperity of the country (loud applause). He would leave the subject now to be handled by gentlemen who were conversant with the matter, and would afford the meeting any information in their power. In supporting this movement, he was merely actuated by what he considered to be the best interests of Ireland (applause).

Mr. J. R. FENNEL expressed his readiness to afford any information in his power as to the cultivation of flax. He had been growing it for the last three years, on his estate near Caher, and had become acquainted with the treatment of the crop in the county Down, where he resided for a long period. For the last three years he had been making the small tenantry about him grow flax, and they had succeeded so far very well. He had introduced the patent scutching machine known as "Rowan's," to which Mr. Malcomson had referred, and they required but a very small amount of skilled labour. The old machine, upon which the present one was a great improvement, required a great deal of skilled labour. With Rowan's machine he could put a little girl to scutch, and she could finish the flax as well as any other mill would do it. Flax is easily grown, not being more difficult than oats. The seed is sown and they should leave it to Providence whether it should be a good or a bad crop. It was when it came to be pulled and steeped that it required careful management. The length of time it should remain in the water varied much—in hot weather it might need seven to nine days, while in cold weather he had known it to require three months. When flax was not properly watered, on its being brought to the mill to be scutching, the millowner could not give a good produce to the grower. If it was brought forward in the manner it should be to the mill he would say it was the best crop a man could grow (Hear). A man got scutching at his place last week, fifty stons of flax, produced from about an acre and a quarter, which he afterwards sold to Russell's agent for £20. He produced a sample of 40 stons of flax that had been grown high up the Galtees, on about three-quarters of an acre. He had become connected with the Munster Flax Society which sent out instructors through the country, gratuitously, to show the farmers how to steep their flax. To provide such instructors was essential to a new district like this, and he thought that could be done by means of small subscriptions. Steep pools, when once made were good for every year. He would be happy to answer any questions that might be proposed to him (Hear).

Mr. FISHER referred to the excellence of Rowan's scutching machines. He had seen a statement that Lord Bandon had grown 40 acres of flax on his own estate, and others in the neighbourhood grew 110 acres of it. Mr. Uniacke Mackay had also tried and got £9 per ton for the straw, on

a produce of $1\frac{1}{2}$ tons to the acre. When it was scutched and sent to the North of Ireland, it paid £30 per statute acre. That was equal to over £45 for the Irish acre. He concurred in the observations that had been made on the importance of the movement, socially and morally. If taken up warmly he believed it would prove remunerative to farmer and landlord, and would give employment to thousands (Hear). Hand-scutching, which would give an immense amount of employment to females, might be done at any time in the farm-house. He hoped the meeting would result in something practical (Hear).

Mr. FENNELL stated, in reply to Dr. Briscoe, in reference to the rotation of crops to be observed with flax, that flax was best grown after lea, oats, and next to that in wheat stubble, but he would never put flax after a manured crop.

Dr. BRISCOE: And if a farmer has a remunerative return on his flax he will be enabled to put back into the ground, in the shape of manure, a fair share of what he took out of it (Hear).

Mr. FENNELL said flax was no more impoverishing to the ground than any other crop, unless they let it ripen for seed. In proof of that he would state that the year before last he grew a crop of flax after oats. Last year he grew a crop of oats in the same ground, and it was four times as heavy as the former crop of oats (Hear). When two years elapsed between liming the land and sowing flax, a very good profit would be produced, but he would not advise lime to be put on immediately before sowing flax.

Dr. BRISCOE: Could you grow flax remuneratively without allowing the seed to mature, and if so, would there be as heavy a crop as if you allowed the seed to mature?

Mr. FENNELL: The best flax is produced before the seed is formed. If we allow the seed to mature without stacking the flax, the fibre is not within 3s. or 4s. per stone of what it would be if the seed had not been allowed to mature. Hand-scutching would be a most tedious operation—the farmer would hardly ever get the money into his pocket, and it would require a great deal of home room. To pull, steep, and stack one acre of flax about eighty hands are required.

Mr. MALCOMSON said an important question for landlord and tenant was involved in the question just discussed. From information he had received from the north of Ireland he was aware that they could allow the seed to come to a certain state—to such a state that it could be ripped from the straw and dried, and then it became available for feeding cattle, mixed with cut oat straw (Hear hear). Nothing could be more useful to the small farmer than this, for it would enable him to do without hay.

Mr. WALSH: I think, my lord, I have some little idea of the feelings of the farmers about this neighbourhood with regard to the growth of flax. I don't think it is a matter that can be forced upon them by the proprietors (Hear). There must be a strong influence—self-interest must induce them to it, or they won't make the experiment (Hear). As I conceive both farmer and manufacturer must have patience in the establishment of the growth of agricultural produce in the country, to which the people are not accustomed, I think if anybody will be induced to commence a manufactory for changing flax into fabric, and say to the farmers—"Next summer, when your next crop will be fit for us, we'll give you so much per stone for it, delivered at a certain place"—that would do more benefit to the promotion of flax than anything else I know of (Hear, hear).

Mr. MALCOMSON said, the establishment of spinning mills must follow the growth of flax (Hear). Encourage the growth of flax, and spinning mills will follow. While they encouraged farmers to grow flax, they should also caution them not to grow forty acres, as Lord Bandon had done, but first try half an acre, an acre, or two acres. Large quantities required more care and management than they were yet prepared to give it (Hear). Let them grow what they could, and do it well.

Dr. MARTIN said another important question was, where was the market for flax? (Hear). Flax, when scutched and prepared, occupied a very small space, and could be conveyed from Waterford to Belfast at 6d. per stone, so that the transit from south to north was a mere bagatelle.

The CHAIRMAN said that he could not enter into Mr.

Walsh's objection. There was nobody prepared to say that he would give a certain price for every stone of flax brought to him. As he understood the resolution, it was simply put forward to remove any difficulty a farmer might have in getting his flax scutched; for, as long as it remained unscutched, it was bulky, and the farmer did not know what to do with it, but after being scutched, it was always marketable, and in the north was sure to bring its value. He (Lord Bessborough) would be ready to assist in the undertaking, as it was brought forward under circumstances more advantageous than when introduced heretofore. He would take a certain number of shares in the company, and would grow some acres of flax, but not as great a quantity as Lord Bandon did. He would not, however, attempt to coerce any of his tenants to do so too; but he would be happy to afford any of them who grew it for their own benefit any assistance in his power, and would be pleased if it proved profitable to them and to the country generally.

Mr. MALCOMSON said he proposed that the company's duties should include that of purchasing the flax from the grower.

Mr. WALSH: Then I am thoroughly satisfied; and I am sure, when the thing is once established, it will work its own way (Hear).

Mr. MALCOMSON then proposed that a local company be formed, to be called "The Waterford, Tipperary, and Kilkenny Flax Improvement Society (Limited)," in shares of £10 each, having for its purpose the purchase and hiring out of scutching machinery, the providing of seeds, the employing of suitable instructors, and the buying the scutched flax.

Mr. WALSH: At a remunerative price to the grower? (Hear).

Mr. MALCOMSON: At a fair market price (Hear, hear).

Dr. MARTIN seconded the proposition, and it was unanimously adopted.

Mr. MALCOMSON said he thought £2 per share would be sufficient for a first call (Hear).

A share list was then opened, and was headed by Mr. W. Malcomson, who took 25 shares, Lord Bessborough 10, Dr. Ryan 1, Mr. E. Power 5, Mr. W. Despard 5; and shares, to the number of 88, were taken by the leading gentlemen present.

Mr. POWER suggested the appointment of a Provisional Committee to carry out the objects of the meeting; and the suggestion being unanimously approved of, the following committee was appointed: Lord Bessborough, Mr. Malcomson, Dr. O'Ryan, Dr. Martin, Mr. Briscoe, Thomas Lalor, Mr. Blackett, John Grubb, Mr. O'Connor, Richard W. Morris, J.P., and John Walsh, J.P.

Printed slips, bearing general instructions for the cultivation of flax, were circulated amongst the farmers present.

Mr. Malcomson was then called to the chair; and a vote of thanks having been passed to Lord Bessborough, the meeting separated.

THE SHORTHORN SHOW AT WORCESTER.—In the heifer in-milk or in-calf class, the first-prize Rosedale, then the property of Lady Pigot, and Mr. Booth's Queen of the May 2nd, the second prize, have both been disqualified, as not having yet proved to be breeding animals; and Colonel Towneley has consequently succeeded to first and second with Roan Knight's Butterfly and Royal Butterfly's Duchess, both of which have had calves, and are well on in-calf again. Noticeably enough, we thus reported of these four animals at Worcester. "Both the prize heifers, the deep, sweet-headed Rosedale, and the neat, well-furnished Queen of the May, look more like qualifying for *Islington than breeding purposes*"; while Colonel Towneley's couple of beautiful Butterflies would promise to be of *more service in the herd*, and hence may-be their secondary honours in public." This was precisely the fact, as heifers not in-calf can of course be exhibited in much more blooming condition than those of the same age either in-calf or having had a calf.

THE HIGHWAY ACT.

A deputation from the Morpeth, Hexham, and Alnwick Highway Boards recently had an important interview with Sir George Grey and Mr. Bruce, the Under-Secretary of State, at the Home Office.

Lord LOVAIN, in introducing the deputation, said that he understood its object to be the discussion of certain proposed amendments to the Highway Act which was passed last session. He wished to take no part in that discussion, but should listen most attentively to the statements of the gentlemen who attended as a deputation, and should not consider himself precluded from taking such course in parliament as he might deem advisable.

The Hon. H. G. LIDDELL said he also desired to state frankly that the questions which were about to be submitted to Sir George Grey were such that it was rather difficult for a county member to please all his constituents in reference to them. He also desired it to be understood that he wished to remain perfectly free and unfettered with respect to parliamentary action.

Sir G. GREY said that he had received several suggestions and memorials in reference to the subject—one from the Northumberland Quarter Sessions, and another from Cumberland—and he was anxious to hear whatever practical men might have to say on the subject before proposing to amend any portion of the Act.

Sir M. W. RIDLEY said he was also anxious to hear what the deputation were about to advance on the subject. He expressed no opinion with regard to the Act as it now stood. No doubt it was susceptible of amendment, but the Government were the best judges as to what course it would be expedient to pursue in reference to it. As a member of the committee upon the bill before it became law, he naturally felt considerable interest in the matter, which had excited a good deal of interest in the county of Northumberland, and unfortunately had not worked quite so harmoniously as could be desired.

Mr. J. HODGSON HINDS said he represented the Hexham Highway Board, but he had been requested to state generally the views held by the gentlemen present who represented all three Boards in this important matter. He wished Sir George distinctly to understand that they did not attend there to complain of the legislation of last session. On the other hand, they were perfectly satisfied with almost all the details of the Act. But they had found it impossible to carry it out in their respective districts, in consequence of the inordinate size of those districts, as they had been fixed by the magistrates. The Hexham district was 42 miles long by 25 wide, but even that did not represent the distances which the waywardens had to travel to attend the meetings. The distance from Hexham of some parts of the district was 28 miles; the roads were very bad in winter, and it was extremely difficult for parties to travel so far and get through the business in one day. There were 818 miles of cart and carriage roads in the district which had hitherto been repaired by the townships. A considerable mileage besides that had not hitherto been repaired by the townships, so that ultimately the mileage would be much increased. The number of townships was 157, and the Board consisted of 157 waywardens, besides the magistrates who might attend. Some of those townships were very small. It was quite true that the Highway Act of last session did not lay down any maximum for the size of the highway districts, but the principle laid down was that each district should be of a size that could be managed by one surveyor and one assistant surveyor, for there was no power in the Act to appoint more than those two. He would venture, therefore, to put it to the consideration of the right hon. gentleman whether it was possible that 815 miles of highway, irrespective of bridle-paths and foot-paths, and of the roads that might ultimately be added, could be properly attended to by two officers. He was aware that the magistrates had memorialised the Home Office to introduce a clause into any bill which might be brought into parliament for allowing an additional number of assistant surveyors. He would not enter

into the question whether it was desirable to have large districts, with large staffs of surveyors; but he would venture to point out that in all other counties in which the Highway Act had been introduced, small districts, in accordance with the principle of the Act, had been agreed upon by the magistrates; and he asked whether it was fair to call upon parliament to make an alteration—(to meet the views, he might say, of the Northumberland magistrates)—to make an alteration in the principle of the Act for that purpose, or whether it would not be more proper to call upon the magistrates of Northumberland to conform to the principle of the Act. But even supposing it were agreed to increase the number of surveyors and assistant surveyors, that would only be the lesser of two grievances that were entailed upon them by having districts of excessive size. The grievance would still remain of the waywardens having to travel those extreme distances, and, when they did meet, to do so in such numbers that to do all the business was next to impossible. He was aware that the magistrates had suggested that some of the large townships should be cut in two, and that, in fact, the parishes, not the townships, should be represented. He need hardly say that each of these parishes had a distinct highway rate, and that it would be utterly impossible to transfer the interest of one township to another without entrusting that interest to persons who had no common interest as to economy of expenditure—who in many cases had a direct interest in saddling a neighbouring township with additional expenditure. He alluded especially to cases of disputed roads. There were a great many roads which had not been repaired from time immemorial by the townships in which they lay, and it was the interest of the adjoining townships that such townships should be saddled with the expense. But, apart from these questions, there was what he would venture to call a constitutional objection to the proposed arrangement. The tendency not only of public opinion but of legislation for many years past had been to increase the power of the people to control the expenditure of the rates which they paid. He would venture to say, however, that if they were to substitute parishes for townships in the county of Northumberland, so small would the number of parishes be, and so large the number of magistrates, that the latter would entirely swamp the ratepayers. The number of magistrates in Northumberland was double, if not treble, that of the parishes. This was, in fact, the main objection to such an arrangement, and it was an objection, he thought, which would not only weigh with the right hon. gentleman, but with the House of Commons, in such a manner as to make it impossible to carry such a measure through parliament. It had also been suggested, in references to the great distances the waywardens had to travel, that the meetings should be held alternately in the larger towns in the district. The effect of carrying out that suggestion would doubtless be that each meeting would be attended chiefly by those waywardens who lived in the neighbourhood; but, on the other hand, it would be impossible to confine the business of the meeting to the affairs of those particular townships, and therefore business relating to other townships would either have to be proceeded with through a series of meetings, at which different persons would take a part, or it would have to be adjourned from time to time till the meeting came round to the particular neighbourhood again. There would consequently be almost interminable delay in getting through the simplest matters of business. He would now place in the hands of the right hon. gentleman a memorial signed by more than half of the waywardens. A larger number would have signed, but the gentlemen who had taken the principal part in the canvass stated that the difficulty had not been to get signatures, but from the size of the districts to meet with the waywardens. Not more, however, than half a dozen of the waywardens canvassed had refused to sign the memorial. He might add that although, taking the whole of the county magistrates, the majority were of a different opinion from the waywardens, in the Hexham district, eleven out of about sixteen acting magistrates had signed the

notice for a division of the district. The signatures of five only were necessary, but it had been thought advisable to show the feeling of the magistrates as well as of the waywardens.

Sir G. GREY: For dividing the Hexham district into two divisions?

Mr. H. HINDE: The number of divisions was not stated. (The memorial was then handed in to Sir G. Grey).

Lord DECIERS said that he attended for the purpose of presenting the memorial from the Morpeth district, which was the same in substance as the other. After the statement made by Mr. Hinde, little remained for him to say. He believed that the Morpeth district was one of the largest and most difficult to manage in Great Britain. It was 50 miles long, and 25 in breadth, and there was a great deal of traffic—more than in any similar district probably in Great Britain. The Highway Board from the first resolved to carry out the Highway Act in a fair spirit, but after a certain period they found that the surveyor could not survey the whole district. Both the surveyor and his assistant having resigned, other officers were appointed.

Sir G. GREY: What salary did you give your surveyor?

Lord DECIERS: We paid £250 a year to the surveyor, and £100 to the assistant surveyor. The new surveyor and his assistant, however, only surveyed a similar part of the district to that which their predecessors had done. Both ratepayers and waywardens were exceedingly in favour of dividing the district. There were 218 waywardens, and of these 155 had signed the memorial. Of the rest, only 25 had refused to sign it. The Board which he represented were exceedingly desirous of carrying out the Act in a spirit of fairness, but so great were the difficulties which they had experienced, that they had felt it to be their duty to present the memorial.

The Morpeth memorial was then handed in.

Sir G. GREY asked whether any parts of the roads had not been surveyed?

Mr. H. HINDE said that in several of the townships the waywardens had acted, by a sort of extra legal process, as the deputies of the surveyor.

Sir G. GREY said that the surveyor's business was not to superintend the laying down of the stones, but only see that the work was done.

Mr. MIDDLETON DANDE, as the representative of the Alnwick district, handed in the memorial from that quarter, and stated that it was the same in substance as the others.

Mr. FORSTER, who also attended from Alnwick, said he had a remark to make with reference to the suggestion that certain townships should be amalgamated with others. There were some townships where there were only a few hundred yards of road at present repaired by highway rates, with many miles of roads that would probably have to be repaired at great cost to the ratepayers, and it was important that these townships should have a share in the representation. With reference to the attendance of waywardens at the meetings, the difficulty was that the Board had to go without information of a most important local nature, and essential business had often to be postponed again and again in consequence. Indeed, more inconvenience had been felt from the want of local knowledge, arising from the absence of waywardens, than from any large number ever present.

Sir G. GREY inquired what was the average attendance of waywardens?

Mr. FORSTER said that it fluctuated much during the sittings of the Board. Occasionally there had been a difficulty in getting a quorum. The meetings were held once a month, and at the commencement, when party questions ran high, the attendance was better.

Mr. RIDLEY desired to make a few remarks as chairman of the Hexham district. They had from the first endeavoured to carry out the spirit of the Act, and he now wished to call the attention of the right hon. gentleman to a few details. He had no fault to find with the Act itself, but only with the arbitrary and most extraordinary mode of its adoption by the Bench. The first point he wished to bring under the notice of the right hon. gentleman was that at present the great evil arose from a total want of supervision of labour. With only one surveyor, such supervision was impossible. Another point was the furnishing of quarterly returns. By the Act they were obliged to make such returns from each township every quarter, which involved sending out 680 copies, and more of accounts, each year, and yet those accounts were

hardly looked at. He suggested that an annual statement, with the liberty to the waywardens to inspect the treasurer's book, would be amply sufficient. Another point was with reference to obtaining money for improvements. At present improvements must be met by rates, and that was very hard upon the ratepayers for the time being. He suggested that the districts should be empowered to borrow money for a certain number of years for objects approved of by the landowners and a certain proportion of ratepayers, say three-fourths. The next point was as to the improvement and widening of bridges. At present the quarter sessions had no power to alter a bridge except by indictment as ruinous or unsafe. He proposed that the Board should have power to request the magistrates to allow their bridge surveyor to alter a road, the Bench still retaining their power over their surveyor. He did not mean that the Board should have a right to demand this, but he thought in some cases their request would be complied with. That, however, was a difficult question. Meanwhile the expenses of the bridges should still remain with the county. Another point was one in reference to trust roads, which in many cases had become bankrupt, and he suggested that where a turnpike road was in that situation, or where no debts were claimed upon it by reason of the creditors considering them bad, the road should be placed under the supervision of the Board. In one case in his district the tolls were not sufficient to repair the roads. The trust was divided into two districts, and one district had funds enough to carry on the road, and the other had not. An order had been obtained from one petty sessional division, but not from another, and the consequence was that the road was in a ruinous state. He thought that was a case which ought to come under the Highway Board. The next point was as to the difficulty of issuing precepts to the different townships. [Mr. Ridley was proceeding to explain this and other points of detail, when Sir George Grey, interrupting him, requested that he would be good enough to put his suggestions in writing, and forward them to the Home Office, where they would receive the most attentive consideration.]

The Hon. H. G. LIDDELL said he held in his hand a draft of a petition from the waywardens and ratepayers of the Morpeth highway district, which it was intended to present to parliament, and the last clause of which prayed the House to appoint a committee, or to take such other steps as might be necessary, to inquire into the allegations of the petitioners. He thought that that was a very moderate proposal.

Mr. H. HINDE said that the great object of the memorialists was that there should not be legislation without inquiry.

Sir G. GREY said that an inquiry was a very legitimate object of a memorial, but the doubt on his mind was whether the Act had been long enough in operation to make inquiry useful. Such inquiry could not be limited to one county, but must extend over all England, and he doubted whether there was sufficient experience of the Act of last session to justify it.

Mr. H. HINDE suggested that the same remark would apply to legislation.

Sir G. GREY said that no doubt it would to any extensive legislation on the subject.

Mr. T. LAWSON said that the Morpeth Board were very anxious on the subject. After the formation of the district, they proceeded to the election of a surveyor and assistant surveyor, and directed the surveyor to make an estimate of the amount required for repairing the roads. As soon as he had got through a portion of the roads, the Board directed him to set about their repair, and his estimates for that purpose had been passed. The Board did not fetter the surveyor as to the mode of his operations, and the surveyor adopted the mode contained in the provisional order published by the justices. At an early period it was found that he was unable to get over half the roads—that is, to pay the workmen, and see that they were on the roads, at least once a fortnight. The Board met fortnightly, and sometimes weekly, and often sat eight hours before they could get through the official business. On finding that the other portion of the roads could not be attended to, they put their machinery in motion for tiding over the winter season. If they had misunderstood the Act in the manner in which the surveyor was put to work, they had at least this to say, that in no other district was any other mode employed than that employed in the Morpeth district; neither had any suggestion been made at their Board meetings, though they had many ex-officio members present at

their meetings, except once, and that was a suggestion by two members—one an elected one, and one ex-officio—to the effect that repairs be made by contract. And yet, in spite of all their labour, they had at present under their surveyor and assistant surveyor only 174 miles of carriage road out of 630. The roads in the remaining portions of the district were repaired, but the townships in which they were situated did not receive any of the benefits of the Highway Act. The waywardens and nine-tenths of the inhabitants of the district were agreed that the present Act contained all that was necessary to the efficient repair of the roads, except only that one surveyor was not enough, and that a multiplication of assistant surveyors would not materially diminish the evil, as the surveyor alone was directly responsible to the Board. The estimate of the amount of money required for the repair of the roads was, in fact, the great matter upon which the expenditure for the year turned; and if it was gone about with accuracy and skill, it ought to present, in nine cases out of ten, exactly the sum necessary to expend on the maintenance of the roads through the current year; and if managed well, the attendance of the waywardens until that was passed by the Board would be all that was absolutely necessary. At other times their attendance might be, to a great extent, dispensed with. But it would be impossible to get over 213 separate estimates in less than five or six meetings of the Board, and unless those meetings were oftener than once a fortnight, the business would be postponed for such a long period as practically to prevent the repair of the roads by the time necessary. If the Morpeth Board had misunderstood the Act, and there was any other mode by which the surveyor could get over the roads, they might be open to the imputation that they had not conducted the business of the Board so efficiently as could be expected; but till some other mode was pointed out by which greater efficiency or expedition could be obtained, he humbly submitted they had done their duty. Mr. Ridley was suggested that much good might be done by building and repairing bridges, and making new lines of roads, and possibly no better plan could be suggested than that of borrowing money for that purpose. He believed, however, that both owners and occupiers would recognise the equity of charging such portion of the money as went towards the repayment of the principal so borrowed exclusively upon the owners of the land in the county, of which he was one. He scarcely knew how to approach the observations which had occurred in the report of the quarter sessions as to disenfranchising the waywardens of certain townships.

Sir G. GREY said that he scarcely understood that to be the suggestion from the quarter sessions.

Mr. RIDLEY said that he was not aware of the contents of the memorial, and had not as a justice seen a copy.

Mr. H. HINDE said that he had not, nor was he aware that such a memorial had been agreed upon.

Sir G. GREY said it was signed by the chairman of quarter sessions.

Mr. LAWSON said he wished to remark that though there were many townships in Northumberland that were not parish townships, yet there was at the same time a very large portion of the Morpeth district that was strictly the boundary both for the poor and the highways. It was important, however, to bear in mind that the different townships could not be properly represented from adjoining parishes, their interests being sometimes very different. Some townships might not have at present many roads to repair, yet they had rights to maintain. Besides, the increase of railways and other considerations made it important that they should not hastily destroy rights that they would have a difficulty in restoring. He had seen 150 waywardens at the meetings, and had never witnessed the least difficulty in transacting the business, except the difficulty and vexation arising from three-fourths of them having sometimes to go away without transacting the business relating to their own townships. There were also in the Morpeth district some parish roads—such as in Elsdon parish—where the Board was placed in the difficulty of not being able to repair the roads in consequence of the whole parish not being in the district. Such a case was not provided for in the Act.

Sir G. GREY: Part of the parish of Elsdon being in another district.

Mr. LAWSON said that one road in that parish was impassable, and the opinion of counsel was that it was difficult to imagine that any township forming part of the parish could

be included in that highway district without the whole of the parish being also included in it. Elsdon parish was pretty nearly as large as some counties. The Morpeth Board had exerted every power under the Act to get themselves in a better position, in which they could carry out the Act in its integrity; and having failed to get redress from the Bench, they had resolved to apply to parliament. They were there to request the aid of the right hon. gentlemen, in order that a clause might be introduced into any new measure which would remedy the present state of affairs. He need not say how undesirable it was that the ratepayers and magistrates should be divided by a spirit of antagonism in any county measure, where the interests of all were really one way. If any alteration were made in the Act, it would be desirable that it should be so amended as to allow the formation of districts for highway purposes in a similar manner to that prescribed by the Local Government Act for other purposes.

Sir G. GREY said it appeared to him that the object of the deputation was rather opposed to the principle upon which the Act was founded—that principle being to leave all details having reference to local matters, such as the division of districts, in the hands of the magistrates, as being far more competent than the government to determine what might be expedient in different parts of the country. It might be right to review that principle, but that was not the question. Very different views were taken in different parts of the country, and it was not contrary to the spirit of the Act that the districts should be large. The only thing that seemed to bear upon that point was that there was provision made for the appointment of one surveyor and one assistant surveyor only. It would be very difficult to take the management of the details out of the hands of the justices; at the same time it was very undesirable that there should be great diversity of opinion, and he should think that the magistrates would be glad to facilitate the operations of the Act in every way in their power. No one could contend, he thought, that parliament should now be asked to control the discretion of the magistrates by fixing the maximum size of the districts.

Mr. HINDE suggested that such division should be made by the Secretary of State on the requisition of the majority of the waywardens.

Sir G. GREY said that the power would be very difficult for the Secretary of State to exercise without taking the opinion of the quarter sessions.

Mr. H. HINDE said he thought the Secretary of State could readily form an opinion whether 800 or 1,000 miles could be surveyed by one surveyor.

Sir G. GREY: Perhaps not; but it had been suggested by a deputation of magistrates that there should be power to appoint more than one assistant surveyor. No doubt there had been an honest desire to carry out the Act, but he had always felt that one deficiency in it was that there was no qualification prescribed for surveyors, whose efficiency would depend entirely upon their practical knowledge of road surveying and making. With respect to the members of the Board, he should rather have supposed that the great numbers attending interfered with the conduct of business.

Mr. ANGUS urged upon the right hon. gentlemen the extreme distance that the waywardens had to traverse. When they were all present, the meeting was unwieldy; and when many were absent, the difficulty was for the Board to get the requisite information. He quite agreed with the general complexion of the Act.

Sir G. GREY repeated that the magistrates of each county were much better qualified to deal with questions of detail than any central authority.

Mr. RIDLEY said that the working body of the Herburn Bench were almost unanimous in agreeing with the deputation, but they were swamped by the magistrates from the other divisions.

Sir G. GREY said he did not think the evil could be remedied without adopting the principle of centralization, which would invade the principle on which the Act was passed.

Mr. RIDLEY said that in the larger districts the ratepayers were not of necessity represented as they ought to be.

Mr. FORSTER said the magistrates did not represent all the land interest. There were many large landowners who were not magistrates. The division of the district should be left to the freeholders, if not to the ratepayers, rather than to the magistrates only.

Sir G. GREY said that there was a provision in the Act for consolidating the townships for highway purposes, and that the magistrates in Shropshire had availed themselves of it by determining what number of waywardens should be returned by the parishes collectively. That did not absolutely disfranchise those parishes, but merely provided that a certain representation should be secured without rendering it necessary that each township should send waywardens, some of those townships being very small. The proposition made from the quarter sessions was that each township should still elect its own waywardens, and that the waywardens so elected should send representatives from their own number, the sessions fixing what that number should be.

Mr. H. HINDE said that the point was considered to be of so great importance in Northumberland that he might almost say that society was disorganised upon the question. If the waywardens were reduced so as to be less in number than the magistrates, they would hardly attend the meetings.

Mr. FORSTER: It would be better to have representatives of townships out of different counties than to have a ratepayer of one township representing other neighbouring townships, their interests being almost always adverse.

Sir G. GREY said that the principle had been carried out in some parts of the country without detriment.

Lord LOVAIN said he did not see any objections to having representative waywardens in the manner suggested, because it did not follow that they would select waywardens from adjoining parishes.

Mr. LAWSON said he was aware that if ten highway townships were comprised in one poor law township, and were put together, it was quite competent for the Bench to give ten waywardens; but there were poor law townships and highway townships in the same parish that had not the same general parish boundary. For instance, the Highway Act would not allow the magistrates to put the parish of Elsdon into one parish for all purposes.

Sir G. GREY invited Mr. Bruce to give his experience of the working of the Act in Wales.

Mr. BRUCE said that the districts in Wales were much smaller than those in Northumberland. In one instance, however, one surveyor managed 230 miles exceedingly well, and he (Mr. Bruce) was rather struck with the fact that in the North of England, where it was supposed there resided an unusual amount of energy, a surveyor and assistant surveyor had only managed 174 miles between them, in a portion of the Morpeth district.

Mr. LAWSON asked what the cost of repair per mile was in the Welsh district referred to?

Mr. BRUCE could not remember.

Sir M. RIDLEY said it was often £8, or from that to £10 per mile.

Mr. LAWSON said that a large portion of the 174 miles referred to cost £84 per mile to keep it in repair, and included repairs by whinstone, limestone, copper slag, iron slag, granite imported from Aberdeen, and other materials that came into competition with each other.

Sir G. GREY said that it was much more difficult to put a road in repair than to keep it so.

Mr. LAWSON said that no doubt some of the difficulties would be met by continued progression on the part both of Boards and surveyors; but this could not apply to roads, the repairing of which for many years had cost from £30 to £100 per mile.

Sir G. GREY said that it was not so much the amount of money spent as the way of spending it. With regard to borrowing money, a clause giving that power was in the bill originally; but the House of Commons objected to it, and it was struck out. He repeated his opinion that the proposition to make further inquiry before the Act had been two years in operation would be useless.

Mr. LAWSON asked if Sir George Grey could suggest any more effective method of putting the roads in the Morpeth district in repair than had been adopted?

Sir G. GREY said that the only practical suggestion he could make was, that they should get thoroughly competent surveyors. What was the name of the gentleman from Scotland who had given evidence on the subject?

Mr. LAWSON said that the right hon. gentleman was doubtless referring to Mr. McConnell, and he had an opinion from him on the subject. (Mr. Lawson handed a letter to Sir G. Grey.)

Sir G. GREY said the letter was rather a long one, and he would read it by and bye, if Mr. Lawson would leave it with him.

Mr. LAWSON: Certainly.

Mr. FORSTER asked what salary Mr. Bruce would suggest should be given to a surveyor?

Mr. BRUCE: To one who has had experience in road making from £120 to £130 a year.

Sir G. GREY: One representation that has been made to me is that a large district is a good thing, because you can pay a good salary, and have an efficient staff.

Mr. HINDE said he should be sorry for the right hon. gentleman to go away with the idea that the deputation wished to increase the number of assistant surveyors unless there was some alteration of the law.

Mr. LAWSON gave some particulars with reference to the appointment and payment of surveyors in Scotland.

Sir G. GREY inquired whether there would be any objection on the part of the deputation to the Home Office furnishing copies of the memorials to the quarter sessions.

Mr. HINDE said there was none.

Sir G. GREY said that it would be advisable for the deputation also to see a copy of the report of quarter sessions.

Mr. LAWSON said they would be most happy to take it into consideration.

Sir G. GREY inquired how the Board appointed their surveyors.

Mr. LAWSON said that they had advertised in the *Times* and in the local papers, and selected the best man out of from 20 to 30 candidates.

The deputation, having thanked Sir G. Grey for his courtesy, then withdrew.

THE GOVERNMENT HODGE-PODGE FOR CATTLE.

Malted barley for mixing with and seasoning the ordinary food of cattle, such as hay, straw, turnips, &c., is one thing; but a medley compound of malted barley and oilcake, as proposed by Her Majesty's Government, is another, and a very different proposition in stock management. From time immemorial farmers have been familiar with the efficacy of malt as a feeding material, and its economy in more respects than one when thus used; and since the condiment question, and the more artificial preparations of food for cattle so as to preserve their health, and at the same time yield a remunerating profit for fattening, together with an improved quality of meat for the public, have become practical problems of no secondary importance—problems which imperatively demand solution on every farm—the use of malted corn of every kind has acquired a greatly enhanced value. Oilcake and linseed are, on the

contrary, objectionable articles, whose use as food for cattle is daily losing credit with those who are capable of forming a just estimate of their intrinsic dietetic value for fattening stock. This arises from the noxious obese-producing elements which linseed and its refuse oilcake possess. We, ourselves, for example, practically speaking, would malt certain descriptions of barley and other corn, and give them to cattle with the view of improving their health and the quality of their meat, and by so doing would at the same time increase both our own profit and that of the consumer, results at present greatly wanted by all parties. But mix the malt with ground linseed or oilcake, and we would neither give it to our fattening beasts or cows, nor eat the meat, nor use the milk of animals fed on such obese or disease-producing food, because obese beef or mutton is diseased meat unfit for human food, or even cats

and dogs' meat, until the obese fat, &c. are extracted by boiling. In short, we condemn the Government hodge-podge *in toto*.

Has the Chancellor of the Exchequer formed an honourable connexion with the linned and oilcake trade? Or has the Government been led upon the ice by some amateur experimentalist of obese notoriety? Perhaps it will be said that "the legal advisers of the crown, or those who prepare the bills for the Government, have 'brewed a peck o-malt,' and that the hodge-podge is only an experiment got up under such circumstances, to meet the exigency of a not very distant general election (P)!" At all events there is something that looks very antagonistically odd, and even ominous, about the medley itself—a medley which we aver will prove eventually, when it has got the length of the stomach, to be of the manure-making and obese meat-producing description, or the very contrary of what the farmer and consumer require at the present time.

Obese beef and mutton for the people, and such a roundabout expensive way of converting his barley, oilcake, and linned into muck for the land, are not exactly what the British farmer requires of the Legislature at the present time. With his broadacres taxed to excess in every possible manner, directly and indirectly, and one item of his produce, viz., BARLEY, so screwed up as to yield a very large proportion of the whole revenue of the kingdom, the Government hodge-podge proposition of reducing the intrinsic value of malt for cattle-feeding purposes to an extent greater than the malt tax itself, reminds us of the Eastern fable of "putting the last straw upon the back of the camel!" Poor relief to "the ship of the desert"!!

Fond mothers often resort to nameless strategical moves and mixtures in physicking their pampered children when they fall upon the sick list; and perhaps, when seen through Government spectacles, the hodge-podge compound for cattle should be read, figuratively, *Hodge-podge for the British farmer*. Nursery prescriptions of this kind naturally involve a two-fold interest for parental consideration—an attractive force at the one end to commence the adventure, but a repulsive force at the other as the finale. A running commentary on the details of a problem so manifest and familiar as this would be superfluous.

It may no doubt be said that the Government prescription is not altogether an exact parallel to the nursery one. The objection, however, can only be entertained to show its hair-splitting insignificance, and how, if any deviation can be proved to exist, that it will make the matter many degrees worse than better; for if it is not physicking the malt-muzzled farmer directly, it is unquestionably indirectly doing both him and the general public, including of course the Government itself, more effectually than were the hodge-podge prescription directly administered to the farmer himself and his honest smock-frock helpmate, the toil-worn labourer!

The object of the Government measure is evidently to continue the malt tax muzzle upon the British farmer, but to take it off his cattle. In this light, the proposition of adulterating and poisoning untaxed malt with a deleterious mixture, thereby reducing its intrinsic and dietetic value, is tenfold more objectionable than the present prohibitory system. The measure, it is true, is plainly declared upon the face of the Bill to be only experimental. But why enter upon an experimental enquiry of this kind by deteriorating the intrinsic value of the article thus experimented upon? Why not begin and end the experimental course with pure unadulterated malt? And not only malted barley, but malted corn of every kind, should such prove to be not only beneficial to the farmer, but also for the advantage of the public at large. And if, as an enlightened nation, we are to start upon an experimental course of so much importance to all, why liberate the ox, and leave his owner muzzled as before? Should future experience corroborate the past, and thus confirm and finally establish the proposition that ground malt, mixed with the other food of cattle, is more advantageous than mixing such food with barley meal, would not this point the finger of progress in the direction of adding a little finely ground malt to the plain puddings of our work-people to improve their dietetic value? This has been successfully done. And if successful with one species of malt (viz., barley) for enhancing the value of what must be termed one of the chief articles of diet (viz., pudding), would not this stimulate inquiry as to the advantage of malt-

ting peas, beans, Indian corn, &c., so as to extend their consumption to the thousands of poor people who are now suffering sadly, as much from depreciation of quality and want of diversity of kind, as from a stinted supply as to quantity?

To all these interrogatories there can be but one answer given, viz., a free and unfettered experimental inquiry. "Muzzle not the ox that treadeth out the corn" is a Divine rule; it involves a moral that has in all ages been observed by nations even in a semi-barbarous state; and the manner the agricultural interest is now treated by the Legislature, relative to the malt tax, is not only out of date, but at the present time intolerable.

According to the present state and progress of things, malt should be free from tax: every British subject ought to enjoy the free privilege of brewing his own ale and porter. In a few cases this privilege might perhaps be abused, but to a far less extent than is generally imagined, while the abuse would gradually grow less with the progress of intelligence. The very hypothesis of the privilege being abused is an invasion upon the province of Reason and social order; for unless it be a sacrifice of domestic economy and individual duty, it cannot be an abuse; and if either, it will eventually effect its own downfall under an intelligent Government. In point of fact, the cause of the abuse is the existence of the malt tax, with its antiquated rules and prohibitions; for before the imposition of this tax no abuse was experienced in less intelligent times than the present, and hence at a period far more subject to turn to a bad purpose privileges of the kind in question.

To the proposition of a repeal of the malt tax, and the freedom of brewing for the exclusive use of the family, the old cuckoo objection that the Chancellor of the Exchequer cannot spare the money will doubtless be raised. The objection, however, falls to the ground for more reasons than one—in the first place, under an experimental inquiry, it cannot legitimately be raised; and in the second place, granting that the Exchequer requires the money, and that it cannot be replaced by any other tax (which is conceding far more than the most extreme exigency of the case can possibly demand), then the rule would be to make those who consume the ale and porter pay the tax directly as an income tax, and to leave malt and the private family brewing tax free. Brewing porter and ale for sale and profit is a somewhat different privilege, and therefore we do not enter upon its discussion directly or indirectly. We address ourselves exclusively to those employed in agriculture. Townspeople are sufficiently gifted in the gab to speak for themselves, and we purposely leave them the privilege of doing so. If they sell as good stuff as the home-brewed, and as cheap, we don't see any reason why they should be taxed; but this they must themselves determine. As to the public revenue suffering loss, experiment is yet wanting to prove that the repeal of the malt tax would ultimately reduce it a single farthing. We ourselves aver the contrary, viz., that the Chancellor of the Exchequer would in a very few years be a gainer by the proposed change. Our reason for doing so is briefly this. It is very natural for the upper and comparatively idle classes to suppose that they pay the taxes; but the contrary is true. The truth of this maxim is now generally credited, and in agriculture it comes home with double force; consequently, as the great consumers of the duty-free malt would be the working classes, at present largely supported by poor rates, and a thousand other charitable sources, it follows that the Chancellor's *working teams*—if we may so call the working classes—*are badly corned*, the plain English of which is a ruinous losing concern at all hands, as every farmer knows who has tried the experiment; and that, from the privilege of using their own home-brewed beer in moderation, in their own houses, and at a fraction of the expense they now pay in public-houses, and from being free from all the contaminating influences of the bad character that frequent beer-shops, they would consequently prove themselves much more profitable servants to the Exchequer. The fact is notorious that the present malt tax has enormously increased drunkenness and depravity amongst our working classes. In this respect it has been from first to last a curse to the country, for in the dark calendar of crime the big half of the whole is due to the unwholesome intoxicating drinks and bad depraved society of the beer-shops. A pint of home-brewed ale at dinner time will not intoxicate a hard-working man; and if he is able to afford as much after his bread and cheese at supper time, it will not make him a drunkard, much

less an inmate of the "lock-up" on the morrow morning, when he should be whistling at the plough. A quart of ale daily to a hard-working man in the open air, and in summer time, under a broiling sun, is a small and harmless allowance, viewed in this light. And as an element of diet, we have often felt for the poor fellows at the close of harvest, when the daily allowances of beer was taken from them, and when they were compelled to drink, out of the same pond with the cattle, water often green with animal and vegetable life! In short, intoxicating malt liquors may be a prudent source of revenue; but we nevertheless plainly aver that the less of such liquors that are drunk as they generally are, the better for the Chancellor of the Exchequer, because the contrary argument would lead to the most heterodox and absurd conclusions imaginable.

And this is not all. Were the prohibition of the use of home-made malt and wholesome family ale in the small farm-houses and cottages of the labourer, and the consumption of malted grain for cattle, the only grievances which farmers had to bring under the notice of their malt-managed representatives at the ensuing election, the reckoning would be an easily settled affair. But there is much more than this in the long outstanding account that must now be finally paid off; for, as members of Parliament, they have not only sold the honest labourer's malt-shovel and brewing apparatus at less than half their value, to start an expensive beer-shop Pandemonium system, but, to effect the purposes of this iniquitous offspring of Bacchus, and uphold it in perpetuity, they have also hunted him and his family to the village from the sweet retirement of the cottage by the way-side, under the sacred oversight of his employer, and the still more endearing occasional visitations of their minister, to lead their devotions upwards at the close of the day, and compelled them to live there in hovels under the smearing attractions of this most improvident state of things! One cannot look upon such a bacchanalian construction of society, from a general or national industrial point of view, without being sorely struck with its short-sighted policy; and what darkens the shade of the picture in a tenfold degree is the unprincipled example of *herd-drinking*, "*beer-bribing*," and other instrumental means of this kind, shown by so many landowners and others of the upper classes, and that too at no time in a more unjustifiable manner than at the election of members to Parliament. Under this abominable example and tutelage, the ragged and ill-fed children of the hard-working villager have to visit these haunts of wickedness for the two-penny worth of drugged, poisoned trash, in order, as it were, to school them by force, at this early period of life, into complete compliance with bacchanalian immorality in its grossest form. The man must be blind in every sense of the word, who cannot see in this the very reverse of cultivating, by judicious political means, the lasting prosperity of the public revenue.

The reader will perceive that in these general observations we have confined ourselves almost exclusively to the dietetic use of malt and home-brewed ale as elements of food. The present dietary of man and beast is subject to improvement. In this respect progress is impetively called for in both de-

partments at the present time, for we are directly and indirectly poisoning ourselves and our cattle by an endless variety of Government hodge-podge mixtures. And what makes the matter tenfold worse than it otherwise would be, is the fact that all this is done to uphold the public exchequer at the enormous sacrifice of the demoralisation and physical strength of our labouring classes! It is no easy matter to condense the details of such a comprehensive subject within the narrow limits of a single article, so as not to give it an exaggerated appearance in the eyes of those who have not practically examined it in all its multifarious bearings; but to such we may briefly remark that, sweeping as some of our conclusions are, and horrible the beer-shop picture drawn, they are not half so sweeping and bad as they would have been, had space permitted us to allow the facts of the case to speak for themselves. If Parliament cannot pull up the Industrial State Coach in its present down-hill broad-road career to everlasting ruin, the country must take the reins into its own hands. The case is a plain, practical problem in "farmer's politics," and, as a practical body, they must address themselves to its solution practically. We cannot for a moment believe that the House of Lords will for the future be actuated by the narrow-minded policy which has hitherto guided its deliberations on the malt-tax question; for, as a legislative body, the Peers by this time must be sensibly alive, individually and collectively, to the fact that there must of necessity be a thorough revival of the present beer-shop and village-hovel systems, and that both Houses, by joint action, must, in this national enterprise, put their shoulders to the wheel to get the state coach out of its present unfortunate bacchanalian predicament. From first to last, a wholesale system of Government hodge-podge poisoning, directly and indirectly, for the blind purpose of producing revenue, in order to save private incomes and property, has proved itself a grand mistake; so that the sooner the statutory command is given to wheel about, and move on in the opposite industrial direction, the better for themselves individually, and the country generally. And besides the general question of taxation, based on sound political principles, the proposition of mixing malt with oilcake, to prevent its being used for brewing in the farm-house and cottage, is mean and contemptible, and far below the standard dignity of the present age. Altogether, we can hardly imagine a more humbling affair in English legislation than this same Government hodge-podge for cattle! No doubt it is well meant towards the farmer, in a certain sense; for it cannot be denied that our villages are teeming with too many that consider anything easily got from their employers a species of gain to both parties—analogous to stolen corn for horses; but they are an exception that ought not to exist, and who could not exist, were the present system done away with, and a judicious one, based upon industrial and economical principles, substituted for it. It is this which characterises the short-sighted policy of the present measure, for sound legislation ought to protect the honest and well-doing from the aggression of the rascal in such a manner as not to check the progress of the general industry and physical welfare of the country. E.

SMITHFIELD CLUB,

At a Meeting of the Council, held March 1st, 1864—Present: The Right Hon. Lord Tredegar, President, in the Chair; Major-General the Hon. A. N. Hood, V.P.; Messrs. Buckley, Joseph Druce, Samuel Druce, Brandreth Gibbs (Sec.), Charles Howard, H. W. Keary, Robert Leeds, R. Milward, E. W. Moore, E. Oyerman, J. Robinson, W. Rigden, Henry Smith, W. Sanday, Richard Stratton, J. Thompson, H. Thurnall, William Torr—

Messrs. A. H. Ellman and Joseph Druce were elected Stewards of Live Stock for the ensuing three shows. Messrs. William Torr and O. Wallis were elected Stewards of Implements for the present year.

The Report of the Stewards on protests made against certain animals exhibited at the last Show were received

and adopted, and the prize ordered to be paid as awarded by the judges.

The Council having considered the date to which the ages of animals exhibited are calculated, determined that no alteration should be made, viz., to remain December 1st, being a few days before the Show.

On the motion of Mr. Torr, seconded by Mr. Charles Howard, it was resolved that the "Members of the Club and Exhibitors be admitted to the Galleries during the time the Judges are adjudicating the prizes, subject to the acquiescence of the Agricultural Hall Company."

On the motion of Mr. Moore, it was resolved that a "Framed Certificate and a Sovereign be presented to the feeder of the first prize animals in the classes;" and Mr.

Moore and the Hon. Secretary were authorized to select the designs for the same.

Directions were given as to Advertisements.

The Prize Sheet for 1864 was revised, and the following alterations and additions made, viz.: 1st, That in each of the following divisions, viz., *Devons, Herefords, and Shorthorns*, there be a new class for Steers under 2 years 6 months old, 1st prize, £20; 2nd prize, £10; also, that the class now limited to animals not exceeding 3 years, be not exceeding 3 years 3 months; and that the other class be for animals above 3 years 3 months. 2nd, That in the Sussex division there be a new class for Heifers not exceeding 4 years old, 1st prize, £20; 2nd prize, £15; and that the other class be for Cows above 4 years old. 3rd, That in future Freemartins be not disqualified for competition in the respective Heifer Classes in the different divisions. 4th, That there be a new class for Ryland, Cheviot, Dorset, or any other pure breed of Sheep not otherwise enumerated in the Prize Sheet, 1st prize, £15; 2nd prize, £10. 5th, That the Medal for Cross-bred Sheep in Extra Stock be for Sheep of a Long

and Short-wooled Cross. 6th, That the ages of the Pig Classes be arranged as follows: A Class for Pigs not exceeding 6 months old (instead of 4 months as heretofore); ditto for Pigs above 6 months and not exceeding 9 months; ditto for Pigs above 9 months and not exceeding 12 months; ditto for Pigs above 12 months and not exceeding 18 months.

It was resolved that a fine of 10s. for non-exhibition of animals entered be imposed on the same conditions as at the Royal Agricultural Society of England; also, that Protests must be delivered in before 6 o'Clock, p.m., on the Tuesday of the Show, and that no protests be received after that time.

The Rules of the Prize Sheet were revised and amended.

It was determined that the Entries for Implements, &c., shall close on the 1st October, as during the last two years.

The Implement Committee was re-appointed.

New Members were elected.

The thanks of the meeting were voted to the President for his able conduct in the chair.

"AGRICULTURAL PUPIL WANTED."

I am in love with advertising. I hired a farm from the advertisement of a popular land-agent; and when in six years' time the balance still kept obstinately on the bad side of my ledger, I disposed of the lease by advertisement, for a sum exceeding a whole year's rent. In my present holding, I buy my "seed corn from the chalk," try "pedigree" cereals, sow barley grown from oats (by asserted "transmutation"), get new-fangled potatoes without eyes, miraculous double-crop peas, and oats "from a Roman encampment," all from advertisement. I lay down leas and sow over old pasture with scientific hay seeds, which come ticketed with all sorts of "gibberish" from those advertised stalls now so firmly-rooted in our implement exhibitions. All my "modern farm implements" were ordered from the pretty pictures in the *Mark-lane* supplement and elsewhere; and I have lots of heavy hardware stowed away for years, in a back hovel where the fowls roost, purchased from the mechanical *cartes de visite* of those friends to wood-engraving, the agricultural engineers. So that I have every reason to think highly of advertisers and advertising mediums: and, moreover, I advertise largely myself, since I resolved to receive "agricultural pupils" (if I could get them), owing to "circumstances of a peculiar nature"—though you must guess whether it really was my being uncomfortable in a big house with a petulant wife and squalling children; my finding myself rather "hard up" in these low-priced corn times; my having two daughters almost marriageable (the eldest "a most amiable girl"); or my considering my farm management so pattern-like (with sundry foul bits and slovenly doings of course left *purposely* as warnings to young fellows "what to avoid") that it must be well worth a handsome premium from any "young gentleman" packed off into the country by some citizen father because either too thick-headed or too unruly for strict hours in the money-making office. And owing to my frequent insertion of a very modest advertisement (for I may surely be allowed to style myself a "leading agriculturist") in certain aristocratic journals, I am in hope of securing the nephew of a real baronet as resident in my house (a "Hall" it is embossed blue on my letter-paper, while the democracy of our genteel neighbourhood has dubbed it a "college.") Mr. P. "has a vacancy"—and no mistake! (in what respect or particulars it might be "invidious" to specify). The

pupils "have every advantage of acquiring a personal knowledge of," &c., &c., or of leading a lazy, vicious life, half sport, half *enauvi*, and wasting the earnestness of one of the best years of youth upon a pipe, gun, and holiday nag. "The domestic arrangements," of course, "are under the direction of Mrs. P.—"; but don't we have trouble enough to ring all up in a morning, and to get all to bed at a reasonable hour? At £80 a year, too (I mean *per annum*, requested quarterly in advance), we can't afford wine even on Sundays to wash down the nuts, and of course we don't "wet both eyes" of the pupils (not the pupils of the eyes, don't mistake!) with hot nogginns at night. Somehow, though I fancy that a "more stimulating diet" might have saved us from the one or two instances in which we had young men who would come home from the village smelling so much like the "smoke" of "The Case is Altered"—they used to give away beer when that was a farm-house, and now they sell it.

All things considered, I am fond of "agricultural pupils;" my wife thinks them "such good company;" so do my two strapping girls, who are very diligently learning "all there is to do in a house;" and we really have had the society of several exceedingly well behaved and business-like young men, particularly one youth who had driven "a curriole" (I think he said) [P curriculum] slap through the Cirencester College, and who told me ten times more about farming than I had ever dreamed of in all my born days.

Well, about advertising. My boy (a fine lad of seventeen when he "takes his age" next April) has mastered all that "my own occupation" seems calculated to teach him, and I want to place him as "agricultural pupil" with some other "leading agriculturist" having "a vacancy," "domestic arrangements," "every advantage," &c. &c., in some heavy clay country, my own district being all light barley and sheep land. Consequently, I sent a polite note (with post-office order) to "the publisher," 246, Strand, and to the two other "agricultural contemporaries," to express my desire in the columns of these "widely circulated journals." Perhaps, some skilful husbandman, moved by much brotherly kindness and charity, might be willing to aid a fellow-farmer in this little "educational arrangement." Would you believe it? no fewer than five-and-thirty "eminent," or else "highly practical" agriculturists immediately addressed me (one-third of the letters

coming by first day's post), setting forth the elizibility of their ground, their crops, their bulls, and themselves for agricultural instruction. I cannot, for the life of me, determine even which to go and look at, to "see if it will do;" and I therefore humbly appeal to the public-spirited editor of "the *Mark Lane*" to help me in my selection. Sir, your motto has always been "Property has its duties" (Do you allude to the malt-tax? because barley is a kind of property that ought not to have any duty, except that it's the duty of every man to submit to a *malted-tax* no longer) "as well as its rights" (And is not one of the *rites* of property certainly matrimony? for none of the heavily-crimlined but lightly-pursed girls seem to "go-off," and I only wish one of my daughters may "be so absurd" as to induce somebody of "considerable expectations" to "name the subject.") And you will agree with me that one of the obligations falling upon a superior farm in the hands of a spirited occupier is that of enlightening and improving the husbandry of its own vicinity, if not of communicating agricultural knowledge to the rising race. Inspired by such large-souled and patriotic sentiments, I myself was led to offer my own business for the information of pupils (with "good references"—banker, lawyer, and clergyman—and no delay in the remittance of stamped cheques). But I was not prepared, sir, to meet with so many almost eager applications for my son and his money; and, if "agricultural pupils" are in such brisk demand, is it owing to some inexplicable love of fatherly control over random young gentlemen, some burning desire to impart of the fulness of their own information, that urges clever husbandmen to seek almost enticingly and imploringly for rustic students? or is it that farming has become such a beggarly pursuit in its commercial aspects, that pupils' premiums are needful toward the butcher's bill, the grocery bill, the druggist's bill, and the bills for ball-dresses, boots, and baby-linen?

My son Gus of course eagerly listened to the contents of the several epistles, as I proceeded to read them aloud at breakfast, when the post-bag came; and really he might well laugh at the agricultural grammar, the provincial diction, and orthography of some of these interesting communications. I transcribe a few specimen quotations (mostly corrected), of course withholding names and addresses, as it is not my business to advertise other people's "comfortable homes, with surveying and book-keeping, and the washing extra," or to say who it may be that is in want of "two pupils. N.B.—Their hunter will be kept." Poor brute! "Kept" going, I suppose, if one screw has to alternately carry two sporting gents. One gentleman sets forth that he has the great novelty of a large flock of sheep "and a thrashing-machine." Another, who offers "good testimonials," intends "to keep only one pupil" at "£50 per annum." "Pork!" said Gus; "that won't do." Another very considerate clay-farmer names his terms, "including wine and a private sitting-room"—[bless us!]"—"if preferred"; and offers the inducement of "the — foxhounds, the — harriers, and a pack of beagles"; so that a better opportunity could not be found by a young gent to learn practical farming and thoroughly enjoy himself. Gus approved of this place, but I didn't. Another gentleman writes word that he has "a constant supply of good water"—[for his live-stock, or for the "four pupils" he proposes to take?—"but that depends on circumstances"—rather!] His village, he says, "has everything requisite for the country, such as church, chapel, doctor, and trades of all sorts," and he

"lives plain and quiet." One farmer has not much land himself, "but there is a wide field available for observation" in the neighbourhood. I was rather "taken" with a letter from a gentleman who says, "I am willing to take him, as I have taken pupils for some years. I will soon have a vacancy, as my last pupil has taken a farm that his friends instructed me to take for him, and look after him. My pupils are considered as members of my own family."

Another correspondent says, "The young gentleman would have every opportunity to acquire a thorough knowledge of agriculture, having a good agricultural library at his command: I consider this of much advantage; reading and seeing the operations will impress it more on the mind; and every attention paid to his comfort in the house." Very philosophical (though not expressed exactly according to *Lindley Murray*), and very nice and pleasant no doubt. The terms, here, were a trifle too high in proportion to the area of land occupied. I am prepared for about £100 a-year, or a trifle less—where a nag is unnecessary, or a temptation to a genteel idle killing of the time. And I was altogether taken aback by one letter from a large farmer, who asks no less than 200 guineas a-year, including the keep of a hunter, in a rare foxy neighbourhood. Gus was tickled by one letter which said, "My family consist of my wife and one pupil, and servant maids; the treatment will be of a generous and free order, gentlemanly bearing, quiet habits." And another was still richer—"Of church principles, living plain and quiet. As to my eligibility to receive a respectable youth into my family, to make him as one of my own, to watch over his deportment in society, my holding is but 150 acres, but there is much to be learned from my neighbours' management; but I do not think there is any more to be learnt on 500 acres than on 150, and very frequently, I imagine, the larger the farm the less it is well managed. I am famous for prize poultry; and, without being too egotistical, may add that my management is second to none. We keep a liberal table." Another affable old gent gossips at large of his business and family. "I have four daughters at home," he says, "so the youth will have no lack of amusement and pleasant companionship for leisure hours" [delightful old gentleman, this must be!] "I am fond of young people; my eldest daughter is married, and my youngest engaged to a professional man. I have one son a corn merchant, another a grocer, two others in the royal navy, one a farmer, and generally one of them is at home, on a visit or otherwise." Gus rather likes the idea; but I don't think I shall let him go there; for five letters, at least, offer very good advantages, and seem just the sort of thing I should like. One of these is from a man whom I know to be a first-rate cultivator, using the steam-plough, raising tremendous crops, and rearing and fattening lots of stock of all sorts. Another is from a good manager (as I have heard by report), and author of several very practical and valuable papers in the *R.A.S.E. Journal*. Another is from a tremendous shorthorn prize taker; another from a great cattle dealer.

After all, I shall put these and a few more addresses in my pocket, and Gus and I will take second-class tickets for these good farmers' stations. Should I find anything wonderfully worth noting, I may perhaps drop you a line, and take your opinion which place will be safest to make a business man of my own hopeful member of the "rising race." Please remember that I myself am still "open" to a pupil.

EX WISE HEAD.

THE CHANCELLOR OF THE EXCHEQUER'S MALT SOP.

I have a far higher estimate of the good sense and correct judgment of the majority of British farmers than for one moment to suppose that they would receive, with any great satisfaction, the Chancellor of the Exchequer's bill permitting the use of malt, duty free, for the fattening of farm-stock, and particularly under the restrictions imposed. The Chancellor pleases a certain class by the concession, and loses nothing by it. It is quite right as far as possible to prevent imposition upon the revenue; and as far as that goes, it ought to suffice for the exciseman to see to the proper admixture of some inseparable feeding stuffs upon the malting premises, and give a certificate of the quantity mixed, upon which exemptions from duty might be claimed. While I entertain this high opinion of our farmers, I cannot but say that I feel assured they will be slow to adopt the act for themselves, or practise the feeding by malt for their stock. I have for some years watched the progress of opinion upon the feeding of stock with malt, and have taken especial notice of the records of various experiments, conducted, in some cases, with great care, and all has utterly failed to convince me that there is in reality any commensurate advantage in the practice, even with malt duty free. I don't deny that malt is a valuable feeding stuff, but I do deny that it is superior to good meals of equal commercial value. I mean this—take this fact—thirty-two stones of barley will not make twenty-five stones of malt (from 24 to 24½ stones is a good average yield). Here then we have a loss in weight of food of full seven stones, and the additional expense of malting, to put upon the malt; which cannot be less than five shillings per quarter, inclusive of labour and carriage, &c.

It may be said that inferior barley will be brought into requisition for malting. Here again my good opinion of our farmers' judgment will soon be justified. Few farmers would be found, after the first blush of the thing is over, to incur the cost of malting inferior barley. Sound heavy barley, although discoloured or coarse in quality, may do very well for malting; but thin light barley will never pay costs. Nor will it do for farmers to commence malting on their own account. This, I unhesitatingly say, would be folly indeed. Malting is of itself a peculiar business, requiring consummate judgment, constant watchfulness, and great experience. No novice, or ever so good but unpractical man, can make malt satisfactorily. It is truly an educational process to get fully initiated. A good maltster is a very valuable servant. The common processes of malting are easy enough, but it is only a good maltster who can obtain the greatest proportion of malt from the steep; all else is merely barley dried again. I name these matters lest injudicious farmers should commence malting on their own account for feeding purposes. Depend upon it the course won't pay, and, moreover, they will have to come under the same rules and regulations as licensed maltsters. A friend of the writer's, who is a man of high respectability and sound judgment, has kindly given him some outline of "*Rules for making Malt by Law*." He is an old maltster, and writes from long experience. He says, "You must keep the barley covered with water in the cistern not less than 40 hours, and then drain the water out, and throw it into a frame called a *couch*. It must remain there (levelled down) for 20 hours; then you can sprinkle it with water any time after it is 12 days old, but sprinkling is of little or no use after it is 12 days old. If 40 hours is too little for your barley,

I think you are then bound to keep it covered with water 52 hours, which is about the proper time that good malting barley should have; and then you may sprinkle at the age of 4 days from the time of throwing it out of the cistern. All good runs of barley require 48 to 52 hours (and one or two hours more in very cold or frosty weather), and will be ready for the drying-kiln at the age of 12 to 14 days, a day or two more or less according to the weather.

"Duty on malt, according to the gauger's measure, is 20s. 8d. per 8 bushels, also 5 per cent. added, 1s. and a fraction—21s. 8d. Fine fresh-thrashed barleys swell so much, that it probably will pay 1s. to 1s. 6d. extra duty, so that the duty on these kinds will pay from 22s. 6d. to 23s. 6d. per quarter. Common runs of barley will pay about from 80s. to 91s. duty—these don't swell so much." The average of barley malted in England would pay about 21s. 8d. duty. "Eight bushels of good barley will produce 8½ to 8¾ bushels of clean malt. The weight of malt is from 38 to 42 or 43 lbs. per bushel, as the quality of barley may be. Of course heavy barleys make heavy malt, still a maltster can make his barley to be either heavy or light, according to his trade. 32 stones of barley well malted will produce 24½ stones of malt, a little under or over.

"Charges for making malt.—If you send a parcel of barley to be made into malt for you (say to Wakefield) they will charge you 3s. 6d. per qr., also the exact duty charged by the exciseman. Country maltsters cannot afford to charge less than from 4s. to 5s. per qr., because they have so little trade in malting for hire. The gaugers measure it in the cistern two or three times during the 40 or 52 hours while in the steep, also in the couch twice, again on the floor during its working two or three times, and sometimes on the drying kiln. From all this measuring, the highest measure is the one upon which he charges the duty. For instance, he measures the cistern and finds 100 bushels malt, from the couch 102 bushels, from the floor 101 bushels, from the kiln 98 bushels; you have to pay upon the 102 bushels. Ninety-nine times out of a hundred the charge is from the couch. *Making malt*.—A man may learn to make good malt in two or three winters, under the guidance and judgment of an old and experienced hand, otherwise he hardly ever could learn to do it properly. Anybody could make barley into some sort of malt, that is to say about one-third or one-half of the grains would be partially malted, the other would be no more than dried barley. *Notices*.—There are all sorts of notices to give the Excise officer. Notice to wet, notice of the number of hours you intend the water to be on steep, besides other notices. However, all these things become a matter of course: nor is the presence of a gauger any great annoyance, if he is a man of good common sense. A man who knows and does his duty is in no fear of an officer. On the drying-kiln it will take from 36 to 46 hours to do it well, and make it thoroughly dry."

My friend having retired from the malting business some few years ago, he says there may have been some little concessions, as there are occasionally, but still the above are the main facts. They are presented to our readers with the view to prevent sanguine or inexperienced farmers "burning their fingers" in incurring unnecessary risk and expense, to say nothing of great vexation and disappointment.

THE FARM HOUSE:

THE COTTAGE, AND FARM OFFICES.

THE MATERIALS USED IN THEIR CONSTRUCTION.

Leaving, then (*see* end of last Paper, page 304), the question of extent of accommodation to be decided as it should be decided, by local or other considerations, let us glance at a few of the essentials to be aimed at, whatever may be the extent of the accommodation decided upon. On the subject of the *living room*, or kitchen, we need say but little; it should be well lighted from two sides if possible, the windows to throw the light on the fire-place. It should be provided with a dresser amply supplied with drawers, and have a liberal allowance of shelves on the walls, and hooks suspended from the ceiling. The fire-place should have a boiler and oven; and the best form we know of is what is called the "Lancashire Range." This is at once cheap and efficient. A description of this we purpose giving in the section on "Materials," in the present series of articles. On the importance of the *scullery*, or *wash-house*, we have elsewhere given the following.

Scullery, or wash-house.— "Aiding mightily the efforts of the good housewife in her attempts to keep the house orderly, is this same convenience; adding also to the attractions of home by getting rid of the annoyance of washing in the living-room. 'Habits of cleanliness and order' can never be characteristic of the labouring classes so long as the structural conveniences—or rather inconveniences—are such as to prevent them having their houses 'clean and tidy;' and which have the effect of accustoming them to filth and disorder. It is a huge folly to look for habits of a superior order where there is every inducement to the cultivation of, or at least the toleration of, those of an opposite kind. The 'scullery' should be large enough to enable washing to be done; and, if there is room for a small furnace and boiler, so much the better; a step higher in the rank of 'healthy homes' will be attained. We look upon this facility for 'washing,' apart from the 'living-room,' as a matter of great importance in dwelling-places for the labouring classes. Few but have heard of—and those are the lucky portions of *man*kind who have only heard—and many are they who have known of the discomforts which the operation of a washing day invariably and unfailingly bring to a household. It needs not here to be stated the evils thus arising—they have formed already the burden of 'song' and of 'complaint'—and, we may add, have not unfrequently acted as an incentive to, or been hailed as, an excuse by the labouring man to leave his own fireside for the evils, but, alas! attractive ones, of the public-house. Let everything then be done to counteract such attractions, and to make a man's own fireside the brightest thing in his memory when he is absent from it, and the greatest attraction when he is at his house. And this addition of a scullery and wash-house will in no small degree tend to make his home attractive, because it will tend to make it comfortable."

As tending to add materially to the comfort and convenience of inhabitants of the cottage, "*cupboards*," or, as they are called in the north, "*presses*," should be given in abundance. It is simply absurd in us to find fault with the untidy habits of cottagers for not "putting things away," as the phrase goes, if we give no place in which to put them. Let us be reasonable in all things. It puts

us in mind, when we hear grave recitals of poor folks' untidiness, of one lady, who, in her profound ignorance of the habits of the working population, inquired, when she saw one of them at dinner performing with a knife those wonderful feats in eating which they so courageously perform, "*Why does not the man use a silver fork?*" Truly silver forks are just as easily had we ween, in some poor men's cottages, as cupboards and presses. Give them the cottage cupboards, and if, after that, you see untidiness, be unsparing in your fault-finding. We have no mercy for confusion when order *can* be carried out; only, with reference to the state of things, examination is reasonable before we indulge in condemnation.

A porch or small entrance hall, leading from the open air to the *living-room*, tends to make that apartment more comfortable; and economising as it does the heat of the fire in winter time, it economises the cottagers' means; and if we can by such a simple matter as a porch do this double kindness to the man, why should not we? May we ask if ever any of our readers have spent a few hours in a room of which the door opened at once upon the street or road? If they have, they will understand why we insist upon a porch forming part of every cottage plan; if they have not, they may believe us when we tell them that it is no pleasant position. We have seen snow drifted half way up the *living-room* through the openings of the door.

Separate entrances to bed-rooms we deem of essential importance, not only in a healthy but a moral point of view. One room should never be entered through another. That privacy and isolation which is imperative, where the claims of decency are attended to, cannot be obtained by having one bed-room pass through another; and in times of sickness the inconveniences are multiplied tenfold.

We have spoken of the advantages of cupboards. We must not forget the important matter of a *provision-pantry*. For storage of provisions we know however of no contrivance equal to the *cellar*. Almost every house in Lancashire has a cellar, even a cottage letting at eighteenpence or half-a-crown a week. Meat can be preserved in them for a much longer time than in pantries placed in the ground floor. But they also add to the dryness of the house, a most important consideration.

But whatever else you have in a cottage, see that you have *plenty of light* to the rooms; for not only does it exercise a healthy influence upon the inhabitants, but it enables the house to be kept clean. For an ill-lighted house is always a dirty one. Believe this to be true, reader. Let the windows then be large and well placed, so that every corner may be lighted, and dirt fly at its approach. So that at any rate if the housewife allows it to lie there, she cannot have the excuse of not having seen it, and thus plead for its continuance.

The physical evils arising from *accumulation of filth and refuse* are now well understood; or, at least, admitted. In the language of sanitary science, "the immediate and direct cause of fever is a poison generated by the decomposition of animal and vegetable matters." It is therefore of primary importance to have arrangements in all cottages by which the refuse of the kitchen, &c., can be

stored up in a place and in such a way as to prevent all noxious exhalations emanating from it. The ashes should be stored up in an ash-pit, which should be in close connexion with the privy, and both of which should be at the greatest distance possible from the house. We mean, of course, within the limits of the back premises. We, at one time, advocated the use of *water-closets* for cottages; but, later and more extended experience has shown to us that they are not adapted for rural districts. There a supply of water cannot be kept *constantly* on, and at pressure; so all modes of supplying them from cisterns we find likely to be neglected. Indeed, even where a supply of water is most easily obtained, a difficulty is sometimes met with in the fact that the cottagers will not take the trouble to turn it on. We have sometimes been disgusted beyond measure at the state of matters we have seen in water-closets, not less so at the abominable laziness or carelessness which caused it. All the sanitary requirements of the case will be pretty fairly met if the privy and the ash-pit are placed in the garden. If the cottagers can be persuaded to throw from time to time the ashes of the fire-places into the privy, the contents will be, to a certain extent, deodorized. By using dried earth—after Mr. Moules' fashion—perfect deodorization will be obtained, and an excellent manure, in no way disgusting to handle, will be available for the garden.

The waste water from the scullery should be led by a drain pipe from the sink or *slop-stone* to the *liquid-manure tank* in the garden. Both of these are essentials in a well-arranged cottage. The sink or *slop-stone*, if of stone of ample dimensions, and not of a greater depth than two inches, will be of immense service in house-wifery operations. The *liquid-manure tank* may be of the simplest possible construction, and will soon repay its cost in the excellent manure it will yield.

A cistern for catching and storing up the rain-water draining from the roof should never be omitted. Rain-water is by far the best for washing clothes and the person; indeed, those who have been accustomed to wash with rain-water take ill when they are forced to use hard water.

The piggery is an essential part of a working-man's cottage in the country. The pig-stye, the ash-pit, and the privy will form when put together the *outhouses*, to which should be added a place for coal and lumber.

There are some points connected with the construction of cottages to which we would like now briefly to draw the attention of the reader. The cheapness of a cottage depends upon several considerations—the size, the materials of which it is composed, and the form or way in which these are put together. The size of the house depends upon the number of apartments it contains, and the dimensions of these. There is a maximum and a minimum dimension for the apartments in a cottage, but it is difficult accurately to define what is the medium. A room too large is almost as bad as one too small; the over-large room is difficult to warm, and there is a difficulty in arranging household matter in too small rooms, where convenience alone is consulted. We confess that we should rather have every room err in excess than in deficiency of space. Like sailors, who love plenty of sea-room, we love ample space in a house. A good size for a living-room is generally now accepted at 144 square feet of floor surface. This will give a square of 12 by 12 feet. We, however, prefer 14 feet by 12 as the better size. Two rooms of exactly the same size may, however, be very different in the accommodation they give. Thus, if the door enters in the centre of one of the sides, the space of floor at each side will be so cut up that it will afford little room for articles of furniture, which therefore will have to be put away in some other less convenient part of the room. The door,

if possible, should be placed at the corner. The size of a bedroom is generally set down at 10 feet square, dimensions we think by far too small, and for the following reasons. As a workman spends by far the greatest portion of his time in his bedroom—we mean of course the time he is at home—we are strong advocates for making it as large and convenient as any room in the house. We are dead set against all bed closets, or bedrooms so small as really to be closets—well named *close-sets*, for that, we incline to believe, is the original term. We believe that many a poor man gets severe cold from being stewed up in a close-set place all night, and rushing off at early morn into the cold and damp air. In cottages the principal bedrooms in the second storey should be allowed to remain the *same size as the rooms below*. The walls running vertically up dictate this, and we therefore deprecate all cutting-up of the upper room, at least by partitions. The height of the living-room and bedroom storeys should be the same; indeed, if health is the main object to be considered, the height of the bedroom ceiling should be greater than that of the living-room, for the reason that we have already stated, namely, that a man spends most of his time in it. Let us then, in the planning of cottages, remember this important department, and in thinking of our own comfort let us not forget that of others, and of the time—

“When dumb night goes softly by
Towards the fiery western sky,
Or lulling birds, and shutting up
The daisy and the buttercup,
And men go to lay their heavy heads
And weary bones upon their beds.”

We deprecate altogether the notion, which unfortunately is very wide spread, that closets are quite good enough for bedrooms, or rather sleeping *places*. A height of 10 feet we consider the least, then, for the ceilings. Economical reasons have generally such sway that the height of bedrooms is crushed down to seven-feet-six or eight feet, a height absolutely absurd. The size of the scullery is of importance, as in it many operations are carried on. We take 10 feet by 8 to be a very convenient size.

The question as to whether a cottage should be *single* or *two-storied* influencing, as it does, the cost of the house should be considered. Much depends upon the accommodation in it. If it is a single cottage for a man and his wife alone, it will be better to make it single storied; if two cottages of this sort are required together, it would make a nice-looking house to build them two-storied, one above the other, the one entering from the back. But the rule in our opinion is decided wherever the cottage has more accommodation in it than a living-room, bedroom, and scullery: then build a two-storied cottage without any debate upon the point. Roof space is saved, and roof space is always a costly thing to cover. By spreading out the rooms in one flat floor you vastly increase the roof space, and, more than that, you place your bedrooms in the worst possible position, next the ground. Bedrooms should always be on the second floor. By putting them there you have merely the vertical walling to pay for, for the roof which could only cover the living-room, &c., on the ground floor if single-storied, now covers both living-rooms and bedrooms. As to attics, our advice is decided, have nothing whatever to do with them; they bring about a wretchedly paltry saving in the cost of construction, and afford at the best miserable rooms, over-cold in winter and over-heated in summer.

The *materials* of which it is composed exercises an important influence upon the cost of the cottage. Bricks, when they can be had cheap, afford the best material. They are warm; not half so easily affected by damp as stone, and require no preliminary working, like that material, before they can be

set up. Where excuses are made so frequently as to the cost of cottages forming an obstacle in the way of building them—as if, as it seems to do with some, cost settled a man's conscience—we wonder why the American style of *framed houses of timber* is not introduced. Of course, natural prejudice at once comes in, to pooh-pooh the suggestion. But calling a project fudge, will not destroy the facts upon which it is based. Now, we happen to know something about American frame houses, or houses composed of timber planks. We have lived in them, and can vouch for the fact that their inhabitants are as keenly alive to the comforts and elegancies of life as we ourselves are. And if any objection is made on the score of climate, assuredly we cannot lay claim to the degree of cold which graces an American winter; winds bluster and rains dash as they do with us, but frame houses notwithstanding oppose bravely the one and resist successfully the other. We have visited a millionaire whose establishment was kept up at no small expense—twenty or thirty thousand dollars we have no doubt—yet he lived in a frame house. Certainly, the worst frame house we ever saw in America—and it looked so ill-constructed, that to quote the Irishman: “Bedad! it looked as if somebody had made it”—yet this was a palace in point of sound external construction, and a Turkish divan in point of internal comfort, compared to those wretched tumble-down, pig-stye, dog-kennel-looking stone houses we have met with in our rambles in this country, and called by courtesy cottages; and of which, in the words of a fellow-labourer in this field of agricultural science, we may describe now, as having “mud or wattled walls, on swampy sites, low wells, roof of thatch rotten with age or green with fungoid vegetation; if timber, decayed; if of slates and tiles, those broken and abounding in holes; doors, windows, and fittings matching the roof in decay, and vying with the dirt and smoke of years, in colour with the mud floor.” If our landlords object to give their labourers cottages more consistent with the dignity of man—even if he be not so good as themselves—than with the grovelling of a beast, for the wretched reason that they cost too much to build; build or erect them timber ones: these will be cheap enough, and we shall gladly guarantee that they will be comfortable. It is right, however, to say that timber cottages are on the increase, and if properly constructed they will last a long time, and be in every way more fitted for the residence of working beings than the wretched huts which they replace. In Sweden and Norway—and surely in those regions the cold is severe enough to stand any comparison with that we have here—these timber houses are much used. They build them with a cavity or space between, what may be called the outer and inner skin of planking, which space is filled up with moss. A very strong and fire-proof mode of erecting timber or rather combined timber and stone houses, we recommended years ago. In this system the vertical framing posts are first put up, and the spaces between crossed with rough timber battens so as to form a series of pigeon-holes—no matter of what shape or form these are. Into these holes stones, broken bricks, or the like are inserted, and the interstices well filled in with mortar. When this sets, a sound and durable wall is obtained.

Of course, in timber constructions—and the remark applies to other materials with as much force—it is essential that the floor shall be well raised above the ground. We have a great horror of cottages placed squat upon the ground. This absurdity in house construction, too often seen exemplified, is not only silly, but it is highly mischievous, for so built, cottages must be more or less damp. Every cottage, then, should be entered by two steps at the very least, but three we are inclined to place as the safer minimum.

The form of the cottage exercises an influence upon its

cost. The form of an exact square is the cheapest, as it encloses a larger space than any other figure. With the same quantity of walling in a square you secure a larger amount of internal accommodation than by any other form. Another great advantage is the simplicity of the roof of a square house. Where look is not desiderated you have only to raise gables, throw a ridge pole across, and put up your rafters—all is of the simplest construction in carpentry. On the other hand, a square cottage is the ugliest you can build: it almost invariably suggests itself as an exemplification of what has been called, graphically if not truly, the “tea-box” style of architecture. If then you require the cottage to be of somewhat pretentious looks, build it with breaks and projections; these always give a pleasing outline, and as a set-off to their extra cost in construction you will find in their nooks and corners admirable opportunities for giving closets, cupboards, and pantries, on the utility of which we have already made some remarks. On the point of *elevational character or design*, we have little to say: no attempt at architectural design should be made, aiming at elaborate effect: simplicity should be the great characteristic of a cottage; and we know of no ornamentation so cheaply obtained, so perfect of its kind, and so satisfactory in its results, as the effect of simple trellis-work covering the porch, or masking the window, up which trailing or creeping plants can be grown. With their graceful foliage set in relief against the whitewashed wall, and the flowers in front in a tiny garden, a cottage to our mind is complete. And, if further effect is desired, give a background to the north in the form of a clump of trees, against which the smoke from the chimney may “rise a twisting blue,” as a western poet exquisitely expresses it, and then you have all that the eye of the painter or the taste of the most fastidious may desire.

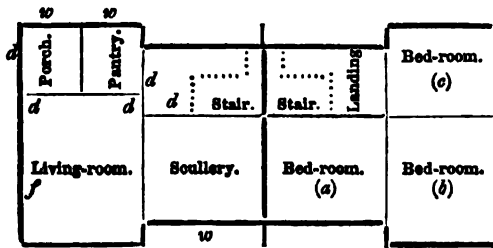
We have thus thrown a few hints together on the subject of cottage accommodation for the labourers of the farm; and, in conclusion, we would take the liberty to impress upon the reader its great importance, and intreat of him to bear in mind that while it is doing the poor a vast injury to bring them up with the notion that everything will be done for them, and that they need not trouble themselves with *self-help*, as they will get enough of *neighbour-help*, there are some things in which the poor cannot by any possibility help themselves, and that this matter of obtaining good house accommodation is one, being, in fact, the most important of them. They cannot build houses: they must be built for them. The evils connected with the sanitary condition of our rural labouring population will not be cured by the hand of time: time will only render them the more malignant. There is no self-contained power of recovery in the case; and if it exists now, each succeeding day weakens its force and abates its energy. The cure, if cure is to come, must come from without. We see, therefore, no hope of the condition of our labouring poor being ameliorated in this direction, if to the poor the task of improvement is left. We write strongly on this matter; for we feel most thoroughly convinced that the question is one which has a close and important bearing upon the future of Agriculture.

Before proceeding to the consideration of the points connected with the Farm Offices or Homestead, we consider it likely to be of some service to our readers if we give here a series of “type plans” suggestive of cottage arrangements, somewhat after the manner of those we gave at the conclusion of our paper on the Farm House (see p. 194 of the present series). In place, however, of giving suggestive arrangements of our own, we deem it likely to be more interesting, if not more practically valuable, to present a short series illustrative of arrangements which have received such stamp of merit as can be given either by their having obtained for their designers the prizes, or the privilege of publication in the pages of the journals or transactions of

Agricultural or Architectural Associations. These plans we purpose giving, without attempting to arrange them on any systematic plan, our object being more to give a series of suggestions in connection with, than an exhaustive treatment of the subject. As noted in paper No. IV., the type plans given have no pretension to accuracy of scale; they are designed merely to show the extent of accommodation, and the relative arrangements of the apartments which constitute this, in the various cottages illustrated. In all the diagrams, the letters *w* indicate the position of windows, *d* doors, and *f* fireplaces.

In Fig. 1 we give, to the left, half ground plan, and to the right, half chamber plan, of a pair of semi-detached

FIG. 1.

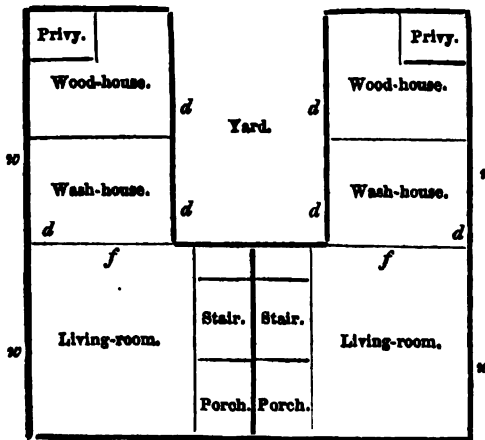


Ground-floor Plan (half). Bed-room Plan (half).

cottages designed by Mr. Goddard, architect, of Lincoln, and to which the prize of the Royal Agricultural Society of England was awarded. The dimensions of the apartments named are as follows:—Porch 5 feet by 3 feet 8 inches; living-room, 11 by 13 feet; pantry, 5 by 4 feet; scullery, 8 feet 6 by 7 feet; bed-room (a), 8 feet 6 by 7; do. (b), 11 feet by 10; (c), 11 feet by 7 feet 6 inches.

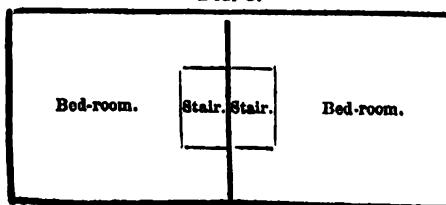
In Fig. 2 we give ground plan, and in Fig. 3 chamber plan, of the celebrated cottages erected on the estate of the late Duke of Bedford, than whom no one did so

FIG. 2.



Ground Plan.

FIG. 3.

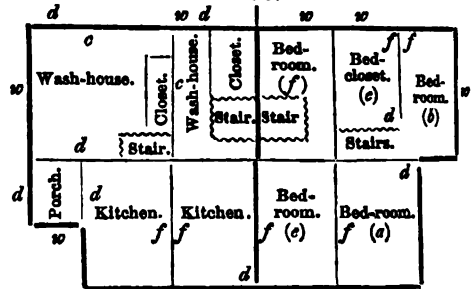


Bed-room Plan.

much towards improving the condition of the agricultural labourer, in so far at least as his house accommodation is concerned. The dimensions are as follows:—Living-room, 11 feet square; wash-house, 10 feet by 6 feet; wood-house ditto.

In Fig. 4 we give half ground and chamber plan of another arrangement of the "Bedford Cottages," in which

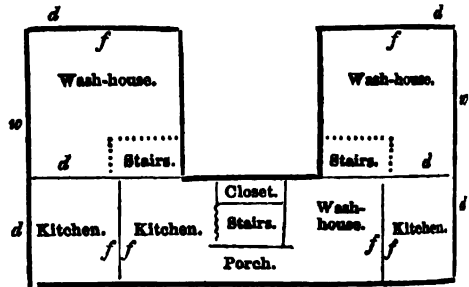
FIG. 4.



Ground Plan (half). Bed-room Plan (half).

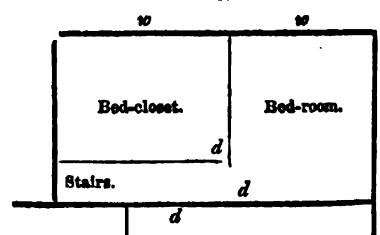
four cottages are placed together, two of these having three, and two having two bed-rooms. The kitchen is 11 feet square; the wash-houses, in the end houses, are each 15 feet 1 inch by 12 feet; in the central houses, 13 feet by 8 feet 6 inches. The two end houses are entered by porches. In the ground plan the letters *c e* indicate the position of wash-boiler or copper. Bed-room (a), 11 feet square; do. (b), 9 feet 6 inches by 7 feet 6 inches; do. (c), 12 feet by 7 feet 6 inches; do. (e), 11 feet square; do. (f), 13 feet by 8 feet 6 inches.

FIG. 5.



Ground Plan.

FIG. 6.

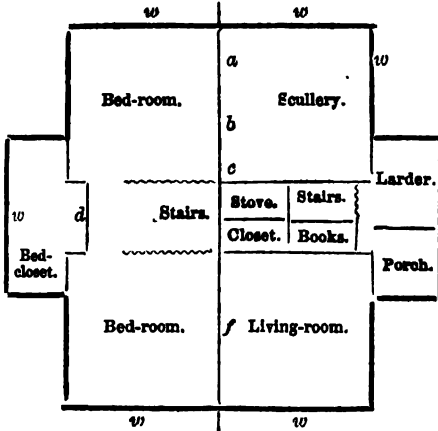


Part of Chamber Plan.

In Fig. 5 we give ground plan, and in Fig. 6 part chamber plan, of another arrangement of the "Bedford Cottages," showing three cottages together, two of which have three bed-rooms, and one of which has two bed-rooms. The kitchens are each 10 feet by 11 feet, and the wash-houses 15 by 11 feet.

In Fig. 7 we give half ground and half chamber plan of the cottages (semi-detached), designed by Mr. Hine, of Nottingham, and for which the prize of the Society of Arts was awarded. In the scullery *s* denotes the position

FIG. 7.

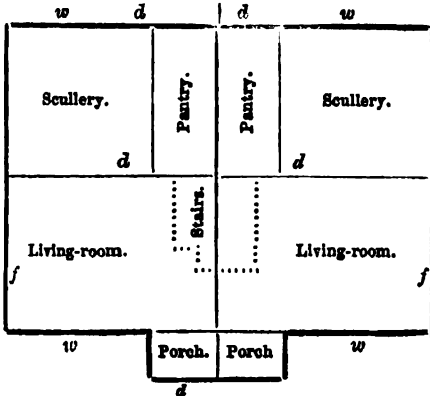


Half Chamber Plan. Half Ground Plan.

of fire-place, *b* that of the wash-copper, and *c* that of the oven.

In Fig. 8 we give the ground plan of semi-detached cottages, designed by Mr. Nicholls, and to which also a

FIG. 8.

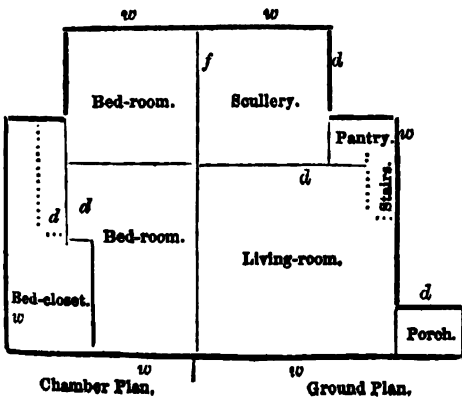


Ground Plan.

prize was awarded by the Society of Arts. In the chamber plan the space occupied by the pantry and scullery in the ground plan is divided into two, so as to obtain two bed-rooms.

In Fig. 9 we give half ground and chamber plans of

FIG. 9.

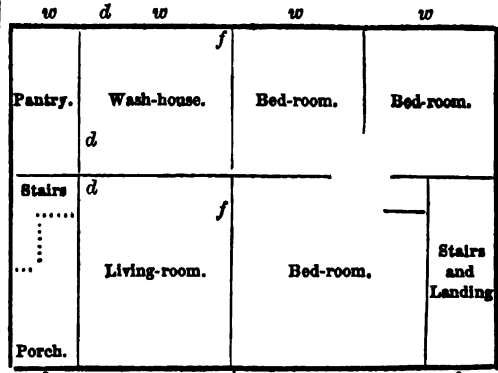


Chamber Plan. Ground Plan.

the plan which obtained the prize of the Bath and West of England Society.

In Fig. 10 we give half ground and chamber plan of the cottage designed by Mr. Isaac, of Bath, and which is

FIG. 10.

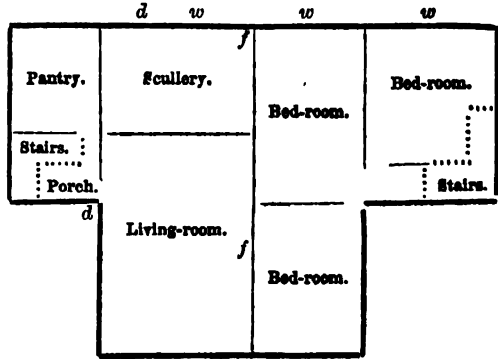


Half Ground Plan. Half Chamber Plan.

published in the prize essay of the Journal of the above-named Society.

In Fig. 11 we illustrate the plan of cottage (semi-detached) designed by Mr. Strickland, and which enjoys a

FIG. 11.

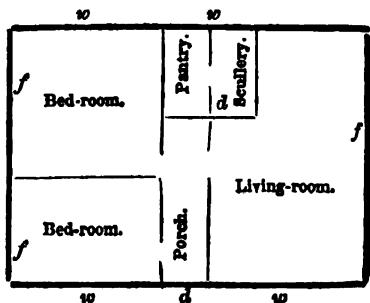


Half Ground Plan. Half Chamber Plan.

high reputation amongst authorities on the subject, as combining in a marked degree the advantages of economical construction with compactness of arrangement.

In Fig. 12 we give the plan of a one-storied single cottage, recommended by the Scottish Association for the

FIG. 12.



Improvement of the condition of the Agricultural La-

bourer; and in Fig. 13 ground plan of pair of cottages,

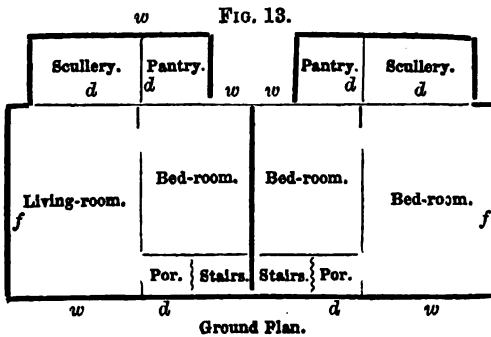
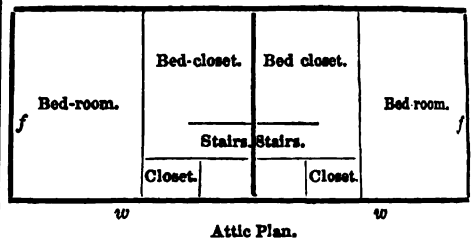


FIG. 14.



with attics, plan of which is given in Fig. 14. For our opinion on the single-storied cottage, and upon attics, see page 318 of the present paper.

THE FARMERS' CLUB.

PROFESSOR VOELCKER ON FEEDING STUFFS.

The usual monthly meeting of the Farmers' Club was held Monday evening, March 7, at the temporary Club Rooms, 8, Robert-street, Adelphi. The chairman for the year, Mr. CONGREVE, presided. The subject appointed for discussion was "Feeding Stuffs," the introducer being Professor A. Voelcker.

After a few opening remarks from the CHAIRMAN,

Professor VOELCKER said: Mr. Chairman and gentlemen, the subject I have the honour to introduce to your notice to-night is a very comprehensive one, and, like other comprehensive subjects, it may be treated in a variety of ways. Thus, I might treat it in a purely practical manner, or I might treat it in a purely scientific way. The chemistry of food is a subject which has engaged the attention of many scientific men. Books have been written upon it, voluminous books, and, let me add, some not very excellent treatises have emanated from the press. Then, again, I might treat the subject by selecting particular kinds of auxiliary food—for instance, oilcake—and speak of matters which are of special interest to the feeder or the fatterer of stock; or I might deal with it in a more general way, by taking into account the processes of nutrition. On my asking myself the question in what way I should introduce the subject to-night, it struck me that perhaps the most acceptable way would be, not to aim at anything like completeness, not to treat the subject either in a purely practical or in a purely scientific manner, but to select such points as may be of great practical utility to the intelligent farmer, and are not, perhaps, generally so well known as it is desirable that they should be. But, at the same time, it is impossible altogether to avoid referring to some scientific points, on which I shall dwell by way of introduction; for the estimate that we form of the value of a food much depends on the use which is made of it, and no proper use can possibly be made of any description of food if we do not regard the application of which the various constituents of food admit. Let me, therefore, in the first place, remind you very briefly, what is the general composition of the body of animals, and then direct your attention to the adaptation of food to the various requirements of the animal system. I shall afterwards proceed to speak more in detail of several descriptions of food, selecting such points as deserve to be most generally

regarded by the farming community, and are calculated to elicit practical information from those who are much better able to speak as practical feeders and fatteners, or rearers of stock, than I myself. Now, if we examine the body of an animal we find that the preponderating constituent is water. Of this I need not speak any further. In the solid portion of animals we shall find, first the substance of muscle or lean flesh, in which there is a large quantity of nitrogen; then we have the fat, which is mixed intimately with the muscle or fibre, and which is deposited in certain parts of the body, or is purposely laid on, as in the fattening of stock; and thirdly, we have the bones, and the saline matters which enter into the composition of the blood, and serve various animal uses. The muscle closely resembles in its composition the epidermal matters, such as the skin, hair, horns, and hoofs. Now, these various constituents must necessarily be supplied by food, in order to keep the animal in vigorous health; for every animal sustains loss through the waste to which every part of the body is subject. But, over and above this daily waste, in order to maintain a uniform temperature in the body a considerable quantity of food of a particular character is also required to maintain what is called the animal heat. According to Bousingault, a horse consumes between 4 and 5 lbs. of carbon in the course of the day, merely in supplying animal heat to the body. In other words, food is required to maintain respiration and sufficient animal heat in the bodily system. Now, in any food we require constituents which supply the muscle of animals; we require also constituents which were well adapted to produce fat and to feed respiration; and thirdly, constituents are necessary containing bone materials and the mineral and saline matters which enter into the composition of blood and serve various animal uses. No food is well adapted for maintaining vigorous health that contains too much of any of the three classes of food which I have just mentioned. But as regards the proper admixture in which we should have these constituents—the flesh-forming, the heat-maintaining, and the bone-producing constituents—no general rule can be laid down; because the wants of different kinds of animals, like the wants of animals of different ages, are so very various. For young stock we want a different mixture of the nitrogenous and non-

nitrogenous constituents, from that which is required in order to fatten animals with the greatest profit. Fattening animals require food which is less nitrogenous and more abundant in fat-producing constituents: Again, for the successful production of milk and the maintaining of dairy stock in good health and condition, we require food richer in nitrogenous matter than that which is calculated to keep full-grown fattening animals in good thriving condition. The cause of this is, that there is a great demand for nitrogenous matter for the production of curd, albumen, and phosphatic matters of milk; for I need hardly remind you that a large quantity of phosphate of lime, as well as a large quantity of nitrogen, enters into the composition of milk. Passing now from these preliminary observations to the more practical part of my subject, I would first direct your attention to what is known in practical farming life concentrated food. The most concentrated food that farmers are in the habit of using is, unquestionably, oil-cake. Perhaps some of you will ask, "Is not linseed a more concentrated food than oilcake?" Well, linseed cannot be used so generally as linseedcake; moreover, it cannot be recommended so much as linseedcake and other descriptions of oilcake on account of the high price of the oil in the seed. No doubt we can fatten animals on linseed if we use it judiciously, that is, in quantities not exceeding 2 lbs. per day per head in the case of bullocks. If we give it with food that is rather binding, with bean-meal, straw, and hay, we may derive advantage from the use of linseed; but in a purely economical point of view, it strikes us as it is not the most desirable description of food. Linseed oil is too expensive. It only produces fat, and as we can obtain fat from cheaper sources than linseed oil, I consider that there is waste in applying linseed for feeding purposes. Linseed cake will be found more economical than linseed itself. This cake is, I need scarcely observe, a most valuable description of food, provided you can get it in a pure unadulterated condition; I have no hesitation indeed in saying that it is then the most valuable of all kinds of cake. It is not perhaps the most concentrated food, if by that term we understand food which is exceedingly rich in flesh-forming or nitrogenous constituents. Viewed in this light, decorticated cotton cake is a more concentrated food than linseed; for this reason decorticated cotton cake is exceedingly valuable for young growing stock provided it be not supplied to them in too large quantities; for if we give young beasts too much nitrogenous or flesh-forming material we do them harm, just as we do harm to our children if we give them too much meat or let them have after a good hearty dinner a good deal of cheese in addition: it is too much of a good thing. It is through the neglect of this point that decorticated cake is in the eyes of some practical men an injurious food; because a bad use is occasionally made of highly nitrogenous matter. Cotton cake is not sufficiently appreciated by some. But, taking it all in all, I think linseed cake of a pure character is the most valuable description of cake we have. We find in it 24 to 28 per cent. of flesh-forming materials; also a considerable quantity of oil, amounting to from 10 to 12 per cent.; much mucilage or gum; and, lastly, a large proportion of phosphate of lime, and only a small quantity of indigestible fibre. The fact is, nearly the whole substance of linseed cake is available for feeding purposes. I believe that even the indigestible fibre, or what is usually considered indigestible fibre, is not

without its use in the animal economy. Be this, however, as it may, the amount of indigestible fibre in good linseed cake scarcely amounts to 9 or 10 per cent. Linseed oil is, moreover, a material which contributes the digestibility of nitrogenous matter, and counteracts the injudicious use which is sometimes made of linseed cake. It is certainly injudicious to give to animals an excessive quantity. I leave it to this meeting to decide what is an excessive quantity of cake. I would rather not give an opinion, although I have my own opinion, on that subject; I throw it out as a point for discussion, What is the proper quantity of linseed cake to be given to store and to fattening stock? I have frequently been asked whether I do not think that foreign linseed cake is preferable to English. A question which is put in such a general way can only be answered in an equally general manner. I would therefore say that, as a rule, English linseed cake is, I am sorry to say, inferior to the better descriptions of foreign cake. This may appear a sad reflection on our own manufacturers, but I cannot help that. In 1856, in a little work which I published under the title of "The Chemistry of Food," I expressed an opinion that English linseed cake was an excellent description of concentrated food, because it was generally obtained in a pure state, and I recommended it therefore in preference to foreign cake. Formerly, English linseed cake was decidedly better than it is at the present time, or rather, I should say, than it was about two years ago. The fact is, linseed cake had become so bad, that farmers set their faces against it. They said to manufacturers, "We won't have any more of that stuff. Unless you make a better description of cake, we must either do without linseed cake altogether, or we must make it for ourselves." Companies have, however, since been started for the express purpose of making pure linseed cake, and at the present time there is not so much difficulty as there was a year or two ago in procuring the pure article, though I am sorry to say it is still rather scarce. You have only to go to Mark Lane, or any other market, to find samples of inferior cakes greatly preponderating over the better descriptions. Time will not permit me to speak in detail of the various kinds of adulteration to which linseed cake is subject. I would, however, observe that the usual guarantee which is freely offered by cake-dealers—namely, that the cake is really a genuine linseed cake—is in reality no guarantee at all, since under the name "genuine linseed cake" is understood a cake which is made from seed genuine as imported; and before linseed cake reaches the shores of England, it falls into the hands of Greek merchants and shippers, who mix it with various kinds of rubbishy seeds, which thus enter into the composition of what is called genuine cake. Such cake may be made, and is made, from seed that is often mixed to the extent of one-half or two-thirds with foreign seeds. Amongst these foreign seeds there are some which are of no value whatever as feeding materials, and others which are even injurious to the health of cattle; hence you may buy a "genuine linseed cake," and yet have an article which it would be better not to give at all to cattle. I would notice another material which is sometimes used for mixing with cake: I refer to bran and pollards, and similar mill refuse. Now bran is a good material, and linseed cake mixed with bran is certainly better than linseed cake which, though sold as genuine, contains a large quantity of foreign seeds that are of no feeding value, or are injurious to the health of cattle. Still, bran is one thing, and linseed cake is another thing;

and inasmuch as linseed is a much more valuable material than bran. Linseed-cake which is mixed with bran should not be sold as pure cake. There is, moreover, another disadvantage connected with this mixture of bran. It is that cake mixed with bran does not keep; it gets mouldy and rusty, and produces, especially when kept in damp places, fungoid growth. Although we have not very precise information respecting the physiological effects of fungi in mouldy cake, yet we know that mouldy cake is a frequent source of injury to cattle. A great many cases of so-called poisoning have been brought under my notice, in which I could detect nothing whatever of a poisonous character, and which, nevertheless, produced a marked injurious effect on the health of the cattle: in these cases fungi were present. We know what effects stale bread, kept in damp cellars, will produce in the human body; we cannot, therefore, doubt that the injury which is done by mouldy cake to the farmer is very great, and inasmuch as the mixture of pollard or bran causes cake to get mouldy when it is kept in damp places, it cannot be desirable that cake should be mixed with bran or mill refuse. Perhaps this is one reason why some descriptions of foreign cake that are never mixed with bran are so highly valued by practical feeders. There is a description of linseed cake which comes from Marseilles, that is not much liked by some farmers and is highly esteemed by others, who have made good use of it: I have never found any bran in that kind of cake. It is occasionally mixed with the African nut—ground-nut cake—but I have never found it mixed with bran. This linseed cake, when squeezed down into a good solid cake, thoroughly excludes the air. This is probably the reason why it keeps so well and loses none of its feeding qualities, and it is for this reason, no doubt, that it is regarded as a very valuable cake by many practical feeders. When Marseilles cake is broken in a good cake breaker it will not be found so hard as to be detrimental to cattle. Moreover, it may be first soaked in water, and made into a jelly that may be mixed with hay or straw chaff. I have come to the conclusion that Marseilles cake is very excellent, because it is generally much purer than other kinds of linseed cake, and because it keeps better. It is not convenient for a farmer to buy cake once a fortnight or once a month; and as cake can generally be bought cheaper at one period of the year than another, a good keeping cake such as Marseilles will be found the most economical, for the farmer can lay in a stock at the best period. Kept in a moderately dry place, such cake keeps well for a whole year, or even longer. I have had Marseilles cake which I have kept for more than two years in a good condition. You will observe the hard condition of the cake, which is considered such a great impediment by some, is in reality a recommendation; it enables practical farmers to lay by a stock of cake at the time of year when it is cheapest, and it preserves the quality uninjured. Enough, however, of linseed cake. Let me now proceed to direct your attention briefly to cotton cake. With regard to this cake, the opinions of practical men are divided. Some have gone so far as to recommend whole seed cotton cake, that is to say the cake which is made from the whole seed, in preference to that which is made from the kernel only, and which is known in commerce by the name of "decorticated," or shelled cotton cake. In a recent discussion in this Club, I believe Mr. Coleman, of Woburn, stated it to be the result of his experience that the whole-seed cotton cake was superior in quality to the decorticated or kernel cotton cake. Now I cannot subscribe to that opinion, for the reason that

all the nutriment resides in the kernel of the seed, while the husk is of no use to cattle. The shell of cotton seed, according to its quality, amounts to 45 to 60 per cent; or on the average, cotton seed consists of half shell and half kernel. The shell closely resembles in its composition cherry stones. It is a substance which a scientific chemist would tell you is composed principally of woody fibre, a material like sawdust. The kernel is exceedingly rich in nitrogenous or flesh-forming matter, and decorticated cotton cake contains as much as from 40 to 42 per cent of nitrogenous matter or flesh-forming constituents. This is a proportion too large to be given with impunity to cattle of any description: it is too large for sheep, bullocks, or young stock, and too large likewise for dairy stock. An excess of decorticated cotton cake produces a variety of diseases. Thus, if you give it in excess to lambs, it produces red water, lameness, and other diseases. If you give it in excess to fattening stock, it produces disgust: the animal loses appetite, and does not eat with relish the food on which it should fatten; it is no doubt for this reason that decorticated cotton cake is held in such low estimation by some practical feeders. Excess in this as in other cases causes injury. Port wine is a very good thing in moderation; but, if you take too much, it does harm instead of good. Turkey is a very digestible kind of food; nevertheless too large a helping may cause indisposition, especially if it forms only part of a good dinner, in which rich plum pudding is considered an indispensable dish (laughter). Decorticated cotton cake ought not to be blamed because some persons use it injudiciously. In whole seed cotton the excess of the nitrogenous matter in the kernel is diluted with a substance like sawdust. Hence, undeorticated cake has frequently been found to produce a better practical result than decorticated; nevertheless the latter cake is the more valuable of the two. The practical conclusion to be drawn from what I have said is, that this kind of cake should be given in moderate quantity, and diluted with food containing a considerable proportion of woody fibre: in other words, we ought to give decorticated cotton cake with a good deal of straw, inferior hay, and roots; it will then be found a very useful material indeed. In other words we ought to give with it some bulky material. It is of great importance, especially in the case of ruminating animals, to feed them with bulky materials, in order to fill out the stomach; and in this way we may make good use of straw and inferior hay. The indigestible matter in the whole cotton cake, though in some cases it may do good, in many others has become a source of serious injury to cattle. If the husk of cotton cake be not ground down fine, and the cake is given to the extent of 4 or 5 lbs., a day per head, so much indigestible food is introduced into the system, that the animal suffers in health. I have had brought under my notice a good many cases of so-called poisoning, cases in which injury was done by whole seed cotton cake; and the general conclusion at which I have arrived is, that the husk of the seed ought to be ground as fine as possible. If this is neglected, cotton seed, as we find it now in the market—decorticated cotton seed has not, since the commencement of the unfortunate American war, found its way to England—if the husk of the whole cotton seed be not ground fine enough, serious injury will ensue; but if it be ground down sufficiently, and if the additional precaution be used of soaking the cake in water for about twelve hours, it may be given to cattle with

perfect impunity. It will then be found a very useful cake indeed, especially for young stock. Still more would I recommend a mixture in equal parts of linseed cake and cotton cake. Cotton cake by itself is too binding in its qualities; but mixed with linseed cake in equal proportions, it will, I believe, be found as useful as linseed cake given alone. A considerable saving of expense may therefore be made in the use of this kind of food, by giving a mixture of these two descriptions of cake. There is another sort of cake to which I would now direct your attention: I mean ground-nut cake. It is like cotton cake, of two kinds; one being made of the whole seed, the other of the kernel of the seed. Desiccated ground-nut cake is well fitted for young stock; but it is not so well adapted for fattening stock, on account of the great excess of nitrogenous matter which it contains. In the next place, let us briefly turn our attention to other kinds of seed which are used as food. Let us consider the leguminous seeds, peas, beans, and lentils. These kinds of seeds possess an analogous composition; but, notwithstanding their great similarity of composition, there is a good deal of difference in their relative digestibility. Lentils are more easily digested than beans and peas. The chemist is unable to discover the reason why they are more digestible. If you look at the composition of these three kinds of leguminous food, you will find that the numerical results are nearly the same; and yet we know that practically the effects which they produce differ. I mention this in order to guard you against supposing that I attach undue value to the chemical constitution of articles of food. The chemical constitution of food I hold to be very material to its proper use; but, after all, in the last instance, we must appeal to practical experience. We must institute feeding experiments; and in order that we may be able to make proper feeding experiments, the dictates or suggestions of science should not be disregarded; on the other hand, the final appeal to the practical feeder must not be disregarded. We ought not to say this food must be good because it contains such and such things, but we ought rather to say that it will be good if it does not contain any unlooked-for injurious substance, which may be present perhaps in too small a quantity to be detected by it with our most delicate reagents, and if it is found by experience to be digestible. So far as practical experience goes, it tends to show that lentils are a very nutritious description of food, particularly for sheep. Indeed, they are too nutritious, if by the term "nutritious" we mean rich in flesh-forming material. A mixture of lentils with food which is poor in flesh-forming constituents—for example, with Indian-corn or barleymeal in equal proportions—will be found a most useful description of food for sheep, as well as for dairy cows, and for bullocks. The leguminous seeds, peas, beans, and lentils, contain, on an average, about twenty-five per cent. of flesh-forming materials. They are, therefore, considerably richer in nitrogenous matters than cereal seeds, wheat, oats, barley, or Indian-corn. In these feeding materials, especially in barleymeal, the proportions of nitrogenous to non-nitrogenous matter are more nicely adjusted than in any other description of food to the requirements of fattening animals. Barleymeal, therefore, is justly valued as a fattening food for pigs, and as a finishing food for every description of stock. It is rich in starch, which, as all of you are no doubt aware, is changed into fat in the animal economy. Wheat when cheap is perhaps still more valuable than barleymeal. It contains about the same quantity of nitrogenous or flesh-forming, and a larger propor-

tion of fattening material; and, on the whole, therefore, it is a more valuable feeding substance than even barleymeal. Indian-corn, on the other hand, is not so rich in flesh-forming constituents as barleymeal or wheat, and for this reason it is an exceedingly good mixture for such food as cake or peas, or beans, or lentils, which are rich in flesh-forming materials. Animals fed on Indian-corn exclusively get fat very quickly; but the substance of which the cells or cellular tissues in which the fat is deposited consists, not being supplied by Indian-corn in sufficient quantity, is insufficiently formed, and the result is that the fat which is deposited in pigs or other stock is too soft. Bacon fries out, runs to waste, and becomes flabby. You can meet this practical inconvenience by mixing Indian corn with peameal or beanmeal. A mixture of these two kinds of food produces very good bacon. Beanmeal or peameal alone produces a bacon which is rather too hard and is not sufficiently fat; while Indian corn on the other hand, produces bacon which runs to waste. Thus we have here an example showing that the inductions of science may be applied with advantage in the feeding of stock. Rice dust is, I must say, but a poor kind of food, notwithstanding that it has been occasionally recommended. It is vastly inferior to barleymeal. I have in my hand a paper in which ricemeal is stated to be a superior food to barleymeal; but on looking at the results I find that the composition of ricemeal, as compared with barleymeal, was ascertained by a chemist who lived some 100 years ago, when analytical processes were as yet in their infancy. Ricemeal is an inferior description of food and is not nearly so valuable as barleymeal. It is deficient in flesh-forming materials, it is also deficient in bone-producing materials, and as generally obtained in the market contains a large quantity of innutritious, indigestible fibre. I have hardly time to speak in detail of hay. Still, one or two observations on the quality of hay may perhaps not be out of place. More especially would I introduce one observation that I have to make. We have the pleasure, and I trust the benefit, of Alderman Mechi's presence with us tonight. I have on several occasions expressed the opinion that hay and grass from irrigated meadows (I do not think much hay is made from irrigated pastures) is inferior in point of nutrition to grass from old pasture or herbage which is grown more slowly. I still adhere to that opinion. A larger proportion of nitrogenous matter is found in the produce of irrigated meadows; but it is very questionable whether the nitrogen that occurs in the produce of irrigated meadows really exists in the form of albumen. I cannot help thinking that the nitrogen which is obtained by analysis of a quantity of such produce does not all exist in the shape of albumen or casein, or similar albuminous compounds applicable to the animal economy for the purpose of producing flesh. I know as a fact, that in irrigated meadow lands some of the nitrogen exists in the shape of ammoniacal salts and other saline matters, which when taken by an animal constantly produce a relaxation of bowels. In all vegetable produce I find ammoniacal salts. The nitrogen is not all present as flesh-producing matter, some of it occurs in the shape of ammoniacal salts, and there may be other compounds which are not assimilated by animals and do not produce flesh. I would here appeal to the practical experience of those who have fattened stock on old pasture, and those who have fattened stock not only upon irrigated meadow grass, but upon every description of food which is grown rapidly, whether injury is not sometimes done in spring by keeping cattle on seeds which have been too

highly manured. When the spring gets warm, and clover seeds spring up rapidly, if you put on your sheep they are sure to scour. The remedy is to take them off as soon as possible and put them on a piece of sainfoin or old pasture. Notwithstanding the high per centage of nitrogen that occurs in irrigated meadow grass, and in all forced produce, I believe that food of that description is inferior to grass and green food of every description which is grown more slowly, and is not so rich in nitrogenous matter. I should like to say a few words here on the feeding qualities of straw, which is not so universally used as food as it deserves to be. In the opinion of some, straw is only fit to be trodden into manure, but well-harvested straw is a very useful feeding material indeed. It is especially useful when it is not allowed to get over ripe. Oat straw is in this respect a most valuable description of food. It is wonderful how much further concentrated food, and a limited supply of roots may be made to go, by giving along with the pulped and sliced roots and linseed cake, broken up into small bits, or made into a jelly, a due proportion of well-harvested straw, cut sufficiently fine into chaff. Oat straw is the most valuable description of straw among the cereals, but it is surpassed in nutritive power by pea straw, and perhaps also by bean straw. Now, bean straw may be exceedingly good or exceedingly bad; it is entirely a question of harvesting. If the beans are allowed to become perfectly mature, if the plant gets over ripe, we then find bean straw very hard and indigestible; but if the farmer is compelled, as is often the case in late seasons, to harvest his beans before they are perfectly ripe in the pod, then bean straw will be found very useful. I mention this in order that you may not entertain the opinion that in every county, and in every season one kind of straw, for example oat straw, is more valuable than another description of straw. You cannot lay down any such rule; it depends entirely upon the condition in which the straw is harvested, and upon what the season was. Thus you may sometimes find wheat straw better than barley or oat straw, or you may find the reverse. But, taking everything into account, perhaps we are not far wrong in saying that pea straw is the most valuable, next to that bean straw under ripe, then oat straw, wheat straw, barley straw, and lastly, perhaps, bean straw over ripe. Thus, you find that bean straw occurs in two places, second on the list and last. With respect to succulent food, or green crops, I could make the same observation that I have just made with regard to the nutritive properties of straw. It depends a great deal upon the condition in which roots are harvested, whether they are nutritious or not. Some localities are peculiarly well adapted for the growth of mangold, and others do not do so well for mangolds as for swedes. In localities where mangolds come to perfection you will find a higher value naturally attached to them than to swedes; but the reverse is the case in localities where swedes arrive better at maturity than mangolds. Hence, we cannot say in an absolute manner that mangolds are better for fattening or feeding purposes than swedes. The composition of every kind of produce, and especially of green produce or roots, is anything but constant. In the north generally you will find swedes preferred to mangolds; in the south, mangolds are held in higher esteem than swedes. I believe the reason for the preference which the farmers of the northern counties give to swedes is, that they contain a larger proportion of sugar, and that the crop arrives better at maturity than mangolds. In the south, on the other hand, where the climate is

warmer, the mangold crop arrives better at maturity, more sugar is formed, and the roots become a great deal more nutritious. This leads me to make a second remark on this subject, which is, that the nutritive qualities of roots depend very much on the amount of sugar, and not on the amount of nitrogenous matter which they contain. In the best mangolds, the best swedes, and in the best turnips the proportion of flesh-forming matter is invariably very much smaller than the proportion of sugar. In immature roots you may find as much as double the quantity of flesh-forming material that you find in perfectly ripe produce. Indeed, the old-fashioned way of testing the flesh-producing properties of roots, namely by taking a bite at them to see whether they are sweet or not, is the best way of ascertaining whether a mangold or a swede is the better food. If you find a swede that is very sweet to the taste and a mangold that is very watery and insipid, you may depend upon it that the swede is a better feeding material than the mangold; on the other hand, if you find a sweet mangold and an insipid swede you may rely upon it that the mangold is the best. The change which the mangold undergoes in keeping consists partly in the conversion of cellular fibre, mucilage, and pectine into sugar. The feeding qualities of mangold improve with time in keeping. In conclusion, I would observe that, quite independently of the composition of food, its nutritive qualities are affected by the condition in which it is presented to animals. I have alluded already to some of the conditions of food which are injurious to cattle. A mouldy or rusty condition of food is injurious; an imperfect mechanical condition is often detrimental to the economical use of food. In the latter respect the cooking of food deserves our attention. I think a great deal might be done by judicious cooking. We all know what is done by good cooking so far as man is concerned, and I believe that a great deal might be done in promoting the comfort and well-being of cattle, and economy in feeding, if more attention were paid to the cooking, steaming, and simmering of food. Cooking will frequently enable us to mix inferior with more nutritious food, and the blending of food which separately would never be given very largely will enable us to make the best of our feeding materials. In this point of view, malt well deserves our attention (cheers). I do not think malt will ever displace barley-meal; I do not think it will ever be as much used as barley-meal in feeding. [Alderman Mechi: "Not for pigs"]. It is too valuable, too costly to be given to animals in that way. But as an addition to inferior kinds of food, very good use may be made of malt. In some parts of Norway and of Sweden, where pigs are fattened upon small potatoes, or potatoes which have been partly spoiled by disease, they are steamed and mixed with a certain proportion of malt, and no description of food is equal in fattening qualities to potatoes and malt mixed together. Here, you observe, the malt counteracts the bad qualities of half-spoiled potatoes, and by mixing malt in moderate quantities with some other descriptions of food, we may, I have no doubt, make food which is not very digestible go a longer way. In the same light, perhaps, are some of the condiments to be regarded. But in a general way, I am not an advocate for the use of condiments, at all events not the use of purchased condiments. If farmers want condiments, let them make them for themselves. There are some condiments which may be used with advantage, but I have no hesitation in saying that every intelligent farmer can make his own condiments much better, and,

by a judicious blending of food, obtain a better practical result than by purchasing prepared food. It is not to be supposed that manufacturers will go to the expense of setting up manufactories and advertising their productions for the mere purpose of offering ready-made food to the farmer. I am afraid, Mr. Chairman and gentlemen, that I have detained you too long (cries of "Go on!"), but the subject is, as I stated at the outset, a very comprehensive one, and this must be my excuse for having occupied so much time. I am aware that my observations have been made in a rather incoherent manner. I felt, however, that by treating the subject in a more cohesive and more scientific manner I might not be so useful to the club as by throwing out hints for the discussion which I hope will follow the address I have had the honour to deliver (cheers).

Mr. JAMES THOMAS said: Nearly the whole of the remarks of the worthy Professor coincided with his own experience, which extended over a great many years. Having fattened a very large quantity of cattle for a period of more than thirty years, he could not but express his pleasure at listening to what he had done that evening; and if there were any young farmers there, who were in the habit of fattening cattle to any great extent, he would recommend them carefully to read and re-read what they had just heard, and to treasure it in their agricultural library as "household words." He had listened most carefully to every word that had dropped from the Professor, and there was little indeed to which he could take exception. He believed that the conclusions stated were founded on correct premises, and he had no doubt that in following them they would all derive great advantage. There was only one thing in which he differed from the Professor. He believed that when they were sparing no expense in getting out cattle for show, the use of cooked victuals would always be found extremely injudicious. He would not deny that by cooking and steaming it they might convert inferior food into what was valuable for stock, and thus be enabled to rear their young stock upon what would otherwise be useless; but of this he was confident, after many years' careful trial, that when they had an animal in good condition, and wished to bring it out in superlative condition for a show, cooked food would not be found beneficial. In saying that he was not dogmatizing: he was giving the result of his experience. With regard to linseed cake, they had been told that evening that it was extremely beneficial for cattle, and they knew it to be so; but the great difficulty of late years, at all events till within the last two or three years, had been to get the article of a genuine character (Hear, hear.) A physician was, of course, perfectly useless to a patient, if the medicines which he prescribed were not obtained genuine; and he was sorry to say, speaking of his own experience, that although there were two or three honourable houses which he had dealt with, as regarded the mass instead of buying of them a genuine oilcake, farmers had bought a frightful mixture, consisting of they scarcely knew what (Hear, hear.) Even when a clever and scientific gentleman like Dr. Voelcker received the mixture for analysis, he was perhaps at a loss to know what the ingredients were, and yet they were of the most unsuitable character for the fattening of stock. They had heard a good deal that evening about cotton cake. On that subject he could only add, as the result of his own experience, to what had just been said, that cotton cake which was not decorticated, cotton cake which was ground in the hull as well as the

kernel, might, under the circumstances mentioned, be a useful corrective, but he felt certain that the husk of that cake was perfectly useless as a feeding article. The proper way of using decorticated cake was, he believed, to use it in judicious quantities, and to be very careful not to overdo it. He was sorry that they had not heard more from the Professor about the case of malt. That case had been, on the one hand, very much exaggerated, and, on the other, very much depreciated (Hear, hear). They had, no doubt, all heard of the famous experiments at Glasgow, where two old Alderney cows were put up, one to be fed on barleymeal, and the other on malt. The result was, as every practical man might have foreseen, very much in favour of barleymeal. But that did not at all preclude them from contending that malt might be used with very great benefit (Hear, hear). The Professor had shown how exceedingly useful it had been when used with potatoes; and probably they all knew, from their own experience, how useful malt was, when an animal was sick or had a delicate stomach. He (Mr. Thomas) did not wish to magnify the case of malt *versus* other things, and would shrink from making any imprudent statements; but for the last twenty-five years he had been in the habit of using malt, particularly in cases of sickness and of falling appetite, and he could scarcely explain to them—and he certainly could not explain to the public—how largely malt conduced to the fattening of cattle and sheep. In all cases of diarrhoea in lambs, and in all cases of scour in old sheep, in the use of ground malt there was a remedy; he had tried it for years and years, and had never found it to fail in a single instance; and yet the Government told them, in spite of its being a remedy, and in spite of the high price of meat at the present time, and when they were anxious by increasing the produce to reduce the price of meat, that the very food which supplied this remedy, and which would reduce the price of meat, ought to continue to be taxed (cheers). He repeated that he did not want to exaggerate the value of malt. It would be folly to tie up sheep or bullocks with malt alone; barleymeal would be better for that purpose; but it was a combination of food that gave a proper tone to the stomach, and if they could feed their animals better by a certain combination than without it, they ought not, in his opinion, to be precluded from doing so (cheers).

Alderman MĒCHI said: Professor Voelcker remarked to me that he purposely abstained from saying much about rapecake. He (Alderman Mēchi) had had some experience, as he believed the Professor was well aware, of the qualities of that cake, having used about 150 tons of it. He was induced to use it thus extensively by a chemical analysis. When he found that according to that analysis rapecake contained all the properties of linseed, in a superior degree in some respects, and that the manure from it, as stated by Mr. Lawes, was worth £4 18s. per ton against £4 12s., the value which was put on linseed cake after being consumed, he was induced to persevere in its use; and he assured them that in a comparison of it with linseed cake he had found that for sheep it produced a greater effect, although the cost was but half that of linseed cake.

Mr. THOMAS: Was the linseed cake genuine?

Alderman MĒCHI: Yes, it was genuine. In that case a chemical analysis and practical results agreed. He had used rapecake for several years. But he must warn them of one thing: even if they had a rapecake that was genuine, it was essentially necessary that it should also be old; for although

when he had sheep on clover eating 2lbs. of rapeseake a day, and when he had accidentally run through his stock, and had had to send for a new supply from the same house, they would not touch it, owing, he supposed, to its being new, and therefore extremely pungent. After a time cotton cake came up, and he agreed with Professor Voelcker that it was, when decorticated, a very excellent thing even at the price at which it was offered, namely, about £7 10s. per ton. Owing to the American war, however, the first source of supply was closed; they now got their cotton seed from Egypt, where the skin was not taken off, but was ground up with it, and he was certain, from experience of this kind of cottoncake on his own farm, that for the fattening of animals it was very inferior to rapeseake. Cottoncake now contained 50 per cent. of husk, whereas, according to Professor Voelcker, rapeseed contained only 15 per cent. It was easy to understand that the quantity of oil in the cake bore the due relation to the quantity of husk, and therefore there was probably 10 or 11 per cent. of oil in rapeseake, and only 5 or 6 per cent. in ordinary decorticated cottoncake. The result of practical observation with regard to a number of animals which he was feeding was that his men had told him they were satisfied that the animals did not get on nearly so well with cottoncake as with rapeseake. But let farmers beware what sort of article they procured under the name of rapeseake. A friend of his, a great agricultural improver, was induced by him to use rapeseake. He (Alderman Mechi) gave him the address of parties whom he might rely upon to supply him with a genuine article; but instead of going to them, he went to a house who supplied him with a rapeseake containing a large quantity of mustard, and the result was that he lost a great many of his sheep, and he was not sure that he did not blame him (Alderman Mechi), although he acted contrary to his advice (laughter). With regard to bean straw and the general preparation of bean straw, he entirely agreed with Professor Voelcker. His animals had already eaten up three large stacks of bean straw; and his stock manager said they must not be put up to wheat straw or any other cereal straw after bean straw, as in that case they would not get on well. They would not eat bean straw unless it were in proper condition; by which he meant that it should be cut with the chaffcutter, and moistened slightly with warm water, in which case, if it were as hard as a walking-stick, it would become mucilaginous and nutritious. He only wished he had six, instead of three, stacks of bean straw in his yard. With regard to other kinds of straw, he had been a good deal laughed at, especially when William Hutley was alive, because he had recommended that straw should be given to animals as food, and he was glad, therefore, to hear Professor Voelcker recommend the use of it in that way. If it were moistened sufficiently, and made agreeable to animals by being pulped and prepared, it would no doubt prove very useful in feeding. He entirely agreed with Mr. Thomas that cooked roots were not desirable. If they wished to fatten pigs quickly, and to make them look bulky, it was a very ready way of doing so to give them hot cooked swedes and barleymeal. Perhaps for the first time pigs thus fattened would take in the man who bought them; but when they were compared with pigs fattened on barleymeal in the regular way, they would be found so light and unsatisfactory that the seller would not get the same customer a second time for pigs fattened in that manner (Hear, hear). At the same time, he thought that very dry food, such as straw and straw chaff, and even very dry cake, which he always mixed with

other food, should be sufficiently moistened to be rendered agreeable and deprived of the harshness which was one of the defects of dry food. He could not agree with the Professor with regard to the qualities of irrigated grasses. He saw before him Mr. Marriage, a gentleman who obtained every day the sewage of 18,000 people at Croydon, which ran over 300 acres of land. In June last, he visited that gentleman's farm and he then saw the produce of Italian ryegrass. The crop was four feet six inches high, yielding ten tons to the acre. He there saw, too, between two and three hundred animals feeding, and he never beheld animals in a finer state of development; their appearance afforded unmistakable evidence that their food was well adapted for the supply of an adequate quantity of bone, muscle, and fat. In fact, what he then witnessed convinced him that the grasses of lands irrigated with the sewage of towns possessed qualities for fattening as well as for growth superior to those of any other grasses. This he said in spite of the experiments of Mr. Lawes, who had come to the conclusion opposed to the fattening qualities of grasses produced by irrigation. He hoped that Mr. Marriage, who had had such extensive experience on that subject, would favour them with his opinions. Any one who wished to know whether or not sewage could be applied to grass land easily and cheaply should visit those 300 acres at Beddington, near Croydon. He would there see the sewage system in full operation.

Mr. J. MARRIAGE (of Moulham Lodge, Chelmsford) wished to state a few facts which had come under his observation. In the first place, he must observe that he did not know whether Professor Voelcker spoke of grasses from sewage or grasses from clear water.

Professor VOELCKER said the principle was the same in both cases. Any produce that was of very quick growth was not so nutritious as produce that grew more slowly; and therefore what he said applied as well to grass land irrigated by natural water as to grass land irrigated by sewage water.

Mr. MARRIAGE said he had had experience with regard to them both for about eighteen years. Wherever he had applied a large quantity of natural water, there he had found his cattle go to feed; where the grass grew very rank and strong, the cattle pitched upon it, and, as far as he could judge, it was not only palatable to them, but also suitable to their nature. Again, as regarded grass land irrigated by sewage, he thought Alderman Mechi had stated the matter very clearly. The grass appeared to suit the animals very well, and the faster it grew the better, he thought, it was. Not only was it adapted for neat stock, but it also appeared to suit horses remarkably well. For about seven months of last summer he sent from five-and-twenty to thirty horses daily to London. They were fed on corn mixed with hay chaff, 2½ bushels being given to each horse, and were racked down at night with the Italian grasses, and no horses could stand their work better. They were light cart horses, and they travelled from 20 to 25 miles every day of the week. That seemed to him to prove that irrigated grasses were very suitable food for them. He had also fed milch cows in the same manner. He had thirty the summer before last, pretty much as an experiment, which had nothing whatever to eat but irrigated grasses for five months.

The CHAIRMAN: Had they no cake or corn?

Mr. MARRIAGE: No. It might have been supposed that those cattle would under such circumstances have run out with scouring, but quite the contrary. There were, he thought, some disadvantages in giving cattle mown food. For example, farmers were often obliged to give it them subject to the moisture of dew or rain; whereas, cattle feeding naturally on grasses were free from that, the sun and wind often

drying their food. His cattle had done remarkably well on irrigated grasses, and he believed that no kind of food would be found richer in vegetable matter. His animals were always well fleshed and healthy, and he must say in conclusion, that he had had no cause to feel disappointed with the feeding qualities of sewage grasses.

Ald. MROHI said he thought he ought to add that he had never found irrigated Italian rye grass scour any animal, however luxuriant the grass might be in its growth.

Mr. FISHER HOBBS (Boxted Lodge, Colchester) said he understood Mr. Marriage to say that the grass which he used was Italian rye grass.

Mr. MARRIAGE said: It was Italian rye grass that was given to the horses, and he liked it best for the cows; but a certain portion of the land was in natural grasses, and those were fed off by the cattle.

Mr. FISHER HOBBS: Not the horses?

Mr. MARRIAGE: No; the horses were fed on Italian grass. The cattle that fed on natural grasses did remarkably well, and were in the fine condition of which Alderman Machi spoke.

Mr. FISHER HOBBS thought it very important that they should know the value of sewage, especially as regarded Italian rye grass. He had used it himself, though not in the same way that Mr. Marriage had used it, because he had not had an opportunity of doing so; and he thought that sewage succeeded better for mowing purposes for horses upon Italian grass than upon any other grass. With regard to the Professor's remarks, there were two or three points to which he wished to allude. The Professor said that 2lbs. of oil per day was quite sufficient for an animal, whereas of oilcake 5lbs. at least would be required. He had heard Alderman Machi speak of something like 15lbs. of oilcake as being used for animals. It was clear that oil used in small quantities was very beneficial; but as the Professor remarked, it was too dear to be used generally. He recollected that in his early days even sugar was used in the feeding of sheep. That was also found beneficial; but, as was too commonly the case, in the feeding of stock, it was given too freely and then it did more harm than good. He had himself frequently seen oil used with injurious results; he had seen it take off the hair from cattle and wool from the sheep's back; but nevertheless that did not prove that such articles might not be very beneficial. As regarded malt, the Professor remarked that it was a kind of food which could not be used to any great extent. He proved, in fact, that because it was so good only a small proportion of malt required to be given. Mr. Hudson, of Castleacre, said that 5 quarters of malt were equal to 7½ quarters of barley; and he (Mr. Fisher Hobbs) hoped they would all profit by the remarks of the Professor with regard to those valuable foods, and especially malt, which might be advantageously used in small quantities. They were, it appeared, equally nutritious with other foods of less value but greater bulk, and might be used with equal benefit. He had only made these remarks lest a wrong impression should get abroad with respect to the use of these valuable articles, and he thought there could be but one feeling on the subject throughout the country, namely, that if they followed the advice of scientific men and used some of the valuable articles to which he alluded in smaller quantities and with more judgment, it would be to their advantage.

Professor COLEMAN (late of Cirencester) said he wished to call attention to a description of nut which was often confounded with ground-nut cake, although it had a different origin, and would be found to be of different value. Nutmeal was comparatively unknown to the British farmer, owing to

the fact that it had only been introduced into this country about three or four years, and that the supply was exceedingly irregular, having now ceased for some months past. Nutmeal was the residue of the kernel of the palm fruit after the oil was expressed in distinction to the flesh of the palm fruit. Formerly, the palm-nut kernel was not worked up; but the value of the oil expressed from it renders it a profitable business. It had very good feeding qualities. Mr. Hobbs had alluded to the importance of a moderate supply of oil. In the nutmeal to which he alluded there was something like an average of twenty per cent. of very valuable, very feeding, and not purgative oil. This meal was first tried, he believed, at Cirencester by himself, upon the recommendation of Dr. Voelcker, and with the happiest effects. It was given to sheep in the proportion of a quarter of a pound per day, mixed with an equal proportion of beans, peas, or lentils, and the sheep were fed out in a superior manner—so much so, indeed, that he had the testimony of the butcher that they were the best lot of sheep that he had purchased during the whole year. The nutmeal was afterwards increased to half a pound, with a corresponding increase of beans or peas. The price of this article was about £6 a ton. It came manufactured as a meal—not expressed into cake, but as a finely ground nutmeal, and with a little care and patience the farmer would find that his cattle could eat it very well indeed. He alluded to this subject because he had lately become aware that from next June a large supply of this nut would be brought to this country. The meal would be prepared here; there would, he expected, be a large supply, and he was also certain, from experience, that if it were tried, there would also be a very large demand. With regard to decorticated cotton cake, he was informed the other day of a circumstance which it might be very useful to mention to the meeting. A considerable mortality occurred among lambs owing to their eating cotton cake that was decorticated. On examination it was found that in some of the smaller intestines there were hard pellets consisting of cotton. Dr. Voelcker would tell them that the proportion of cotton in the cake was very small, and we should hardly have expected that it could produce such an effect. There was another feeding substance to which the doctor had not alluded; he meant the locust bean. He had given them some excellent advice about making their own condiments. Now, if they took a leaf out of the condiment-maker's book, they would find the locust bean to be an article they all used considerably. It was not very expensive, it was exceedingly rich in sugar, and it might be judiciously and economically mixed with the various other foods which had been so well described. In the event of malt being found too expensive to be used, a small proportion of locust bean might be found to have the same effect as malt. With regard to sewage irrigation, having recently had the pleasure of spending a morning on Mr. Marriage's farm, he could endorse what had been said that evening about the splendid appearance of the crop. He visited the farm just before the severe frost in the beginning of January, and he walked through twenty acres of Italian ryegrass as level as the floor of that room, nine or ten inches high, and of a most luxuriant character. He also had seen from forty to fifty head of young growing stock eating up the fog on the irrigated land, and no stock could look in better condition. Those cattle had nothing else but the grass, and had not been housed.

Alderman MROHI observed that they had been there all the winter.

Mr. G. MARTIN (Hubert's Bridge, Boston,) said he had used cotton cake himself, with neither good nor bad results; but he had friends who had suffered very severely from it; they had lost lambs, not by tens but by hundreds. He had

not used decorticated cotton cake, because he could not get it; his friends, to whom he alluded, had ceased using cotton cake, on account of the bad results which it had produced. If they compared these various foods, they would find them to be as dear as oats, beans, and peas, and yet none of the speakers that evening had laid any stress on their own commodity. He would tell them his own experience. At the beginning of the winter he ceased to use good foreign linseed cake, and turned to peas and oats. On going from cake, he did not increase the quantity, but gave the same weight of food as before, and was satisfied with the result. As regarded rapecake, he could never get his stock to eat it. Alderman Meechi might say he bought it too new—this he did not admit; as he had tried both new and old, still the stock would not eat it. The price of rapecake was the same as that of their own produce.

Alderman Meechi: No; £5.

Mr. MARTIN said he thought it was £6, which was precisely the price of oats. The Alderman said that bean straw was a very good food, particularly if it was nicely mixed. He (Mr. Martin) had never found bean straw of any use except as a basis for stacks. In reference to the Croydon sewage manure for grasses, a friend recommended him to use it, he obtained a supply, but the produce did not improve; he supposed all the benefit had stayed at Croydon (laughter). In conclusion, he begged to say that his sole object in rising was, to impress on them the desirability of using their own produce as far as possible, instead of rape cake, cotton cake, and adulterated linseed cake, especially as the learned Professor told them that they could not get any of the articles genuine.

Mr. T. DUCKHAM (Bayham Court, Ross, Herefordshire), said there was one point to which he should like to call the Professor's attention, particularly at this time of anti-malt-tax agitation; it was one of the most interesting questions that agriculturists had before them at the present moment; he referred to the value of sprouted barley. They had not all got malkilns; and perhaps those who were in that position would not get them put up for them very readily. But he had been assured that barley, when it had just thrown out the roots and put forth the sprout, was of equal value with malt for feeding purposes, and he should like the Professor to favour them with his opinion on that point.

Professor SIMONDS said he believed that the interesting lecture which they had heard that evening was likely to prove very profitable to farmers. He could bear testimony to the value of what had been said, with regard to the importance of different kinds of food upon the health of animals and their feeding powers, and he wished to make some remarks on that point. First, with reference to linseed cake, he agreed with Professor Voelcker that it was the very best form of cake they could use, and he thought it was preferable to linseed itself for many purposes. There were some cases in which they might use linseed with advantage. He felt the great importance of the question just put by Mr. Duckham with regard to the sprouting of barley. He (Professor Simonds) was old enough to recollect when the great fat horses that used to come up to London out of Lincolnshire were made fat entirely upon sprouted barley, linseed, and steeped-beans. It was found that with a small quantity of food of that kind they accumulated a large quantity of flesh as well as fat; and if that compound was examined it would be seen that it possessed all the nutritive matter which every part of the system required, and was well adapted for both old and young animals; that it was well suited to the organs of digestion, and well calculated to preserve health. He was inclined to think that in feeding they might use oilcake with considerable

advantage, making it into a pulpy mass like that kind of mixture to which the Professor alluded. In many parts of Lincolnshire, as he knew from practical observation, it was not uncommon for the farmer to allow 2lbs. of oilcake per day to each cart-horse. But it was used in this way: The cart-horse had four horses say to look after; 8lbs. of oilcake were put into a tub at night, and two or three pails of water were thrown upon it. There it was allowed to stand till the morning; and in order to make the ordinary chaff and corn diet of the animals palatable and digestible, to preserve their health, and to keep their organisation in a proper condition, some of this oilcake gruel was dashed over their food at each feeding time. Speaking from practical observation, he might say that he had seen the health of animals well preserved in that way, and had observed them looking as well as any farmer could desire his horses to look. He had for seven or eight years occupied a heavy-land farm in the neighbourhood of London, and he had adopted that plan of feeding cart-horses with great practical advantage. He now came to cotton cake. Cotton cake was unquestionably for young animals as good a feeding material as they could possibly have. It was rich in flesh-forming matter; it was especially rich in phosphate, and helped to build up the bones of an animal better than food which was more rich in nitrogen. With regard to cotton cake he had not heard any allusion to the fact that the huaks of the seed were now crushed into powder and mixed with the kernel for making the cake. There was one serious objection, he might remark, to unadulterated cotton cake, namely, that it was apt to act on the intestinal canal so as to cause stoppage and inflammation. He was convinced, from observation, that the kind of cotton cake to which he had alluded might be used not only with impunity, but with very great advantage, the huak being finely ground down and mingled with the pulp of the cotton seed. He would now allude to the straw question. The use of straw as food had been advanced by Alderman Meechi, and he (Professor Simonds) believed that by a great number of the farmers of this county straw had, in that point of view, been too much neglected. At the same time it should be borne in mind that it was not good food in itself. It contained a great deal of matter which remained for a long time in the stomach and intestines, and after all the animal did not extract a large quantity of nutriment from it. This should make them rather chary about the use of straw. A great deal depended on the age of the animals to which it was given. His experience tended to show that if they used straw cut into chaff for young animals even with a moderate quantity of pulped mangold—mind he was now speaking of young cattle, or cattle soon after weaning—provided their object was to kill them, they could do nothing more likely to effect it. It was, he might remark, too much the practice of farmers to pinch cattle during the first year. They were all acquainted with the system of putting young animals in the straw-yard—indeed, too often it was a straw-yard and nothing else—and the result was that, in the spring of the year, the animals came out a mere bag of bones, predisposed to diseases of various kinds. He was now speaking of the danger of using straw cut into chaff in excess for young animals with delicate constitutions. If indigestible materials got into the alimentary canal, disease would ensue, and the animal would probably die from diarrhoea. He said this in order to caution farmers against, not the use, but the abuse of straw. It was a good agent if properly used. He quite approved of the steaming, whether for old or young animals, particularly with regard to bean straw. He could bear out Alderman Meechi's remarks with reference to the feeding value

of bean straw. If the straw were well cut and tolerably clean it might very profitably be steamed, having in it very useful feeding material. As regarded a certain condition of cake having a tendency to produce disease and death, he could fully endorse what had fallen from Dr. Voelcker with respect to a mixture of bran in the cake, causing moisture to be retained for a considerable time, and fungi to be developed. Speaking medically, he must say he attached great importance to the influence of fungi upon the animal organisation. Not long ago a gentleman lost several valuable horses which he had been feeding with damaged oats. Some of these oats were sent to the veterinary college, together with some of the morbid parts of the animals; and not only were the oats found to be largely affected with fungi, but fungi were also found in the stomach and alimentary canal. The fungus in that case was one of those which he believed to be poisonous. The death of animals often took place from unknown causes, and he thought the cause frequently was that fungi were taken with food. If food were not pleasant to the taste of animals, it was not fitted to maintain health; and he was convinced that in numerous cases special, as well as other diseases in animals arose either from the kind of food they were living upon, the kind of water which they drank, or the air which they breathed. He would not specify particular kinds of food as liable to produce injury, but he was satisfied that a great deal of disease was to be traced to the food, as well as to the condition in which it was given to animals (Hear, hear).

Mr. L. A. COUSMAKER (Westwood, Guildford) said: As regarded green food, the quality of roots in his opinion depended very much on the varying circumstances of soil and climate, upon whether the crop was grown in the north or in the south of England, and whether the year was a wet or a dry one, and also upon the time of year at which different species of roots were used. In the north of England beasts could be fattened on turnips and swedes alone, whereas in the south they could not be fattened without a certain amount of corn or some other additional food. As Professor Voelcker remarked, in the south they could produce a rather better mangold than was produced in the north. They all knew that in a wet year though they might obtain a large crop of mangold wurzel, yet the quality would not be so good as in a sunny year. Mangold required a certain amount of sun, and he considered that in the south, when properly used, it was better than swedes or turnips. In the early part of the year, in September or October, perhaps white turnips were most nutritious; after that, swedes were the best given for a certain period, and when swedes began to get leathery mangold came to perfection. Therefore, he did not think they could say what root was most nutritious as a whole; what they had to consider was what root was most nutritious at a certain time of year. In April mangold was a most superior root. A great deal had been said on the question how grass crops were affected by rapidity or by slowness of growth. On that point his own opinion was that crops which grew very fast were flashy and had not the same amount of nutriment as crops which took a moderate time to mature. As regarded oilcake, a friend of his having once remarked to him that a good deal of what was sold as oilcake was trash, and that the seed must be more nutritious, he determined to try pure linseed. He hated the trouble of cooking food, and accordingly he merely steeped the seed in cold water. There was a succession of tubs. A quart of linseed absorbed about, he thought, two quarts of water. Having been frequently stirred up, in the course of forty-eight hours, linseed became a perfect muckilage, and that muckilage when mixed with good, clean

cut hay, was taken up readily by the animals, and they did exceedingly well upon it. The cost of that food was about one-third less than the cost of linseed cake, while the cattle did equally well upon it. He was quite satisfied with it. If, however, frost came, he was obliged to go back to linseed cake; and after the frost was over, the animals would not return to the muckilage. This suggested a most important question. Animals knew very well what they liked and what they disliked, but he should be glad if Dr. Voelcker would state whether what they liked best was in all cases the most nutritious. Various things were presented to animals which they ate with avidity and relish, but he was not certain whether that was always a correct criterion of value as food.

Professor VOELCKER then replied. Some of the questions asked in the course of the discussion had, he said, been already answered by Professor Simonds, and he should therefore pass them over. He had been asked whether produce which grew quickly, and therefore coarsely, was inferior or superior to produce which grew slower, and was therefore finer. He had no hesitation in saying that the finer the quality of grass was, and the more slowly it grew, the more nutritious it would be, weight for weight. That was, however, altogether a question of degree. He was not so ridiculous as to assert that sewage grasses, or grasses obtained by the application of sewage to meadows, had no nutritious qualities. No one, indeed, would be so absurd as to continue the expense of irrigation with sewage if there were no benefit. The question was entirely one of degree; and what they had to decide was, what kind of crop was of the most value, weight for weight. There could be no doubt that an abundant supply of coarse grass was a great deal better than an insufficient supply of the most valuable, most nutritious, and most concentrated food. The question was, he repeated, Which was the most valuable, weight for weight, a fine quality of grass or a coarse quality? and on that point they had such an abundance of practical evidence that it would be a work of supererogation on his part to produce any additional proof that the slowly grown and finer produce was the most nutritious. As regarded the question raised by Mr. Cousmaker, whether the taste of animals was a correct indication of the nutritive qualities of food, he would merely say at that late hour that while they should not altogether disregard their tastes, animals clearly might, like naughty children, acquire bad tastes, which it would be necessary to overcome.

On the motion of Mr. Charles Howard, seconded by Alderman Mechi, thanks were voted to Professor Voelcker for his introduction.

Thanks were also accorded, on a motion of Mr. Trethewy, seconded by Mr. Cousmaker, to the chairman.

THE CATTLE DISEASES PREVENTION BILL.

THE CHAIRMAN said: The discussion on the question fixed for consideration that evening having now terminated, he begged to say, that there was another topic which it had been thought desirable to bring before the meeting; he referred to a Bill which had been introduced in the House of Commons by Sir George Grey, entitled the "Cattle Diseases Prevention Bill." That was a Bill in which they were all interested, and which would, it was believed, if passed as it now stood, prove very detrimental to the owners of both fat and store cattle. One of the clauses provided that if any cattle in their transit to market were found to be affected with foot or mouth disease, they might be stopped when delivered from the train, or at any other point on their route. That serious conse-

queness might result from such a clause was obvious. The result might be ruinous to cattle dealers without any benefit to the public; and his object in introducing the subject was to show that the Farmers' Club was awake to its importance. He concluded by calling upon Mr. Giblett to address the meeting.

Mr. GIBLETT said the subject was one of vital importance to all concerned in the feeding of cattle, especially as the second reading of the Bill was fixed for the following Wednesday. There was the highest authority for stating that the foot-and-mouth complaint was not at all injurious to meat (Hear, hear). It was, in fact, much worse five-and-twenty years ago than it is now. He had known as many as forty oxen, that were affected with it, to be killed in the market on several successive market days, and so bad were they that they could not walk to the slaughter house only about 200 yards off. He confidently affirmed, therefore, that the foot-and-mouth disease was not of foreign origin. In the opinion of almost all practical men it was an epidemic arising from atmospheric influence. The Bill in question was so ridiculous in some of its provisions that even if it were passed, it would be impossible to carry it out. On the Thursday after the last great Christmas market in London there were about 10,500 cattle, and he believed that 2,000 of them had the foot-and-mouth complaint. He had often had a hundred head of cattle sent to him from Scotland. On going to Gravesend to receive them, he found, that although they were perfectly healthy at starting, yet owing to N.E. winds on the voyage, the majority of them had become affected with the foot-and-mouth complaint. He was therefore perfectly justified in stating that the disease in question was an epidemic, and due to atmospheric influence. He had himself been deputed as chairman of his trade to take steps for opposing the Bill. The City Remembrancer recently waited upon Sir George Grey, and obtained from him a promise that the Bill should be referred to a committee. If that were done, he (Mr. Giblett) would be contented, believing as he did, that evidence could readily be offered, which would prevent a Bill so ruinous to their interests from being passed (Hear, hear).

Mr. S. SIDNEY thought that a petition or memorial should be drawn up, and signed by the chairman on behalf of the club.

Alderman MROHI would like to hear Professor Simonds' opinion as to whether or not the disease previously referred to was injurious.

Professor SIMONDS believed it was not. Persons had been for twenty-five years trying to find out the injury, and they had not discovered it yet. He wished to add that active measures had been adopted by the salaried men. A committee, to which he had the honour to belong, had waited on the city authorities, and induced them to take up the matter vigorously. A circular had also been sent to every member of Parliament, pointing out the injustice which would be done to farmers, and to the rearers and feeders of cattle, if such a Bill were allowed to pass.

Mr. JAMES HOWARD thought the subject was one which could not be entertained that evening. He for one did not fully understand the nature of the Bill. Last session, however, Mr. Holland, one of the best agricultural members in Parliament, introduced a Bill, the object of which was to protect British farmers and the British public against the diseases in cattle, and the Government induced him to withdraw that Bill by promising to bring forward a similar measure, and he thought the club might stultify itself by at once declaring itself opposed to the Bill under consideration. That would, in his opinion, be acting precipitately.

Mr. FISHER HOBBS could not agree with Mr. Howard that there was any precipitation in the case. All that was now desired was that a committee consisting of about half-a-dozen persons should be appointed to watch the bill, and prevent it from passing in an objectionable form (Hear, hear); and he hoped the meeting would decide to a proposition to that effect. The danger to be guarded against was obvious. He would mention a state of affairs with which he was himself familiar. Animals exported from the continent were landed at Harwich or some other seaport; they stood there for an hour or two on the jetty, exposed to a cold easterly wind; and, under this measure, if they were found to have foot-and-mouth disease, they would none of them be allowed to pass into the interior. As Professor Simonds had just remarked, in five-and-twenty years no one instance had been proved in which the flesh of an animal had been injured by foot-and-mouth disease. It was very different in that respect from lung disease. Mr. Fisher Hobbs concluded by moving the appointment of the following gentlemen as a committee to watch the progress of the Bill, and to take such steps as they might deem fit: The chairman of the club (Mr. Congreve), Professor Simonds, Mr. Giblett, Mr. Robert Leeds, Mr. John Hudson, and Mr. Fisher Hobbs.

Mr. JAMES HOWARD still objected to anything being done in the matter, in the name of the Club, without the members generally being first consulted. Having read the bill that morning, he must say he thought there was a great deal that was good in it. Mr. Fisher Hobbs had alluded to the landing of cattle at Harwich. At present, vessels which brought cattle went backwards and forwards without any security for their being cleansed. In the bill under consideration there was an enactment providing that every vessel which brought cattle to this country should be cleansed before it went back again (Hear, hear).

Mr. GIBLETT wished to correct an erroneous impression which seemed to exist—namely, that foreign cattle having foot-and-mouth disease might now be landed in England. There was already a most rigorous examination; and he had known cases in which, because two or three animals were found to have the tongue disease, as many as 250 were stopped.

The CHAIRMAN: So have I.

Mr. GIBLETT continued: He had known cases in which, under such circumstances as he had just mentioned, two or three hundred oxen had to be killed on the spot, at a loss, perhaps, of £3 per head; and he ventured to affirm that, under the existing law, no cattle were allowed to enter England from abroad with foot-and-mouth disease.

Mr. JAMES WOOD could see no objection to the appointment of a committee to watch the bill, and oppose any clauses which were clearly objectionable. He would add that he himself had during the last year fifteen young heifers, which had never been off the farm, and were isolated; and nevertheless, all had foot-and-mouth disease.

The CHAIRMAN, advertent to the remarks of Mr. Howard, said there was no time to convene a general meeting; and he hoped that, as the majority of the members present were clearly in favour of the appointment of a committee to watch the progress of the bill, there would be no further opposition to the motion.

The motion, having been seconded, was put, and carried unanimously.

The meeting then separated.

THE CATTLE DISEASE QUESTION.

We now come to the concluding part, or what may not inaptly be termed the climax of our subject, viz.; the improvements required to bring up our present system of conveying cattle to distant markets to the requirements imperatively demanded by all interested. On the question of proper food and normal health before the animals leave the homestead or grasing of the farmer, we shall not advance a single sentence, the intervening period between that and the time they are slaughtered affording ample materials for our present limits, and more, perhaps, than we shall be able to condense into one article.

There are three methods of conveying fat stock to distant markets, that call for notice, viz., firstly, the old drove-system; secondly, the railway; and thirdly, steam-boat or sailing vessel.

The former of these three systems—"The road"—is not adapted for cattle forced forward to early maturity. Oil-leaked stock are, for example, bad walkers; and the fact requires to be more closely examined from a physiological point of view than it has yet been done, in order to determine how such should be the case. Neither is it the heaviest and fattest animals that are the worst travellers, the quality of the food consumed being equal; for large numbers of half-fat oxen and sheep will be found ever lagging behind and lying down upon the road the moment an opportunity occurs for doing so, some of the heaviest and fattest being far a-head. Generally the feet give way, becoming greatly inflamed; but there are many cases, in every large drove, where animals are obliged to be left behind, not from sore feet, but muscular and nervous exhaustion, the poor brutes being done up and requiring rest before going farther. But when the feet and muscles both stand, and when animals are properly attended to relative to food and rest, they yield a superior quality of meat to those that are conveyed by sea or by railway; and the difference of quality is much greater than is, perhaps, generally credited, either by the farmer, the butcher, or the consumer.

In popular phraseology, this difference is often attributed to a corresponding difference in the natural constitution of the animals thus exemplified; but such is not a practical solution of either of the two questions involved. On the contrary, it looks more like an apology for mismanagement, or a set-off to cover ignorance, than a satisfactory method of inquiry to determine what the facts of the case really are; for when closely examined it resolves itself into mismanagement of the cattle, on the one hand, before they leave home; and on the other hand, a serious loss to the farmer from an inferior quality of the article sent to market. Were it a piece of broad cloth, samples of iron or pottery ware, the public would at once blame the manufacturers and not the articles manufactured; but because it is beef and mutton, is that any reason why a thinking public should join the farmer in laying the blame upon the helpless innocent ox and sheep? Does not such a pseudo-method of reasoning the matter justly deserve to be visited with that retributive hand of justice which so many provinces of the United Kingdom now experience, where hundreds and even thousands of cattle are being carried off by disease? No longer can an excuse, or even an apology be accepted for a course of conduct so irrational and out of date.

The time was when improvements in the droving of fat cattle would have formed an interesting topic for discussion in the columns of the leading stock-market journal of the kingdom; and even now that railways and steamboats convey the greater number to distant markets, still it must be borne in mind that between the homestead of the farmer and the railway station, and between the terminus at the other end and the slaughter-house, fat stock suffer severely under the existing practices. If we compare, for example, the care bestowed upon cattle sent to our Christmas fat stock shows and summer meetings of the Royal Agricultural Society and other societies with that bestowed upon fat stock generally, there will be found a difference that calls for serious consideration; animals receiving comparatively no harm in the former two cases, while

at a fat stock market farmers often declare they have no little difficulty in recognising their own cattle. Thus heavy animals are allowed to heat themselves, to destroy their feet, and derange their bowels: so that when put upon the railway-truck they suffer severely, both in cold weather and mild; consequently, when they arrive at their destination, they are "off-feed," and, in short, in an abnormal or diseased state, the quality of the beef and mutton being thereby less or more injured. Drovers, salesmen, and butchers accustomed to the same barbarous routine week after week may think little about what the cattle suffer, or how much the quality of the meat they yield is deteriorated. We have even heard some of the blue-frocked gentlemen declare that it greatly improved the quality; but, *per contra*, we have heard intelligent farmers exclaim, "Murder and ruin!" and no wonder, when the dark catalogue of facts is fully and fairly weighed in the balance.

Fat stock intended for distant markets should be trained for the journey. This is more especially needful when they are fed upon oilcakes and other feeding materials that have a tendency to increase the weight of the fluids of the body and to soften the solids, thereby reducing their tone, strength, and weight; and also if kept in warm buildings, in stalls or boxes, so as to soften and distort their feet, when, under such circumstances, they would require some ten or fourteen days to prepare them for the nearest market town. How careful are we to prepare our show cattle and racehorses for the work before them! And in accordance with the principles thus acted upon, the best plan for training fat stock, so as to qualify them for a week's hard work in marketing—often fourteen days training are necessary in order, to obviate the heavy reduction both of weight and quality now sustained. What the general amount of loss might be on stock from the northern counties can with difficulty be approximated; but on many individuals it exceeds double the present expense of railway conveyance.

This conclusion naturally brings us to our second proposition—the improvement of railway conveyance—so as to obviate disease and the heavy carnage now experienced. Cannot railway trucks be constructed so that each animal may have a separate box, with the privilege of lying down at pleasure? Suppose, for example, a truck sufficiently wide to hold two boxes in breadth and three or four in length, the cattle standing with their heads foremost; each truck would thus carry six or eight beasts. With a fixed partition along the middle, and a drop-door between heads and tails, and a folding-door at each end, there would be three or four animals in each partition in a string; so that they could walk into the truck at the back or tail-door, and out of it at the front or head-door.

The objections usually raised to carrying large cattle separately are: *first*, that animals would neither feed nor lie down to rest and ruminate in railway trucks; *second*, that they would destroy themselves against the sides of partitions; and *third*, that the advantage gained would not cover the extra expense incurred. But all this is mere verbiage, got up as dust to throw into the eyes of farmers, and thus extenuate the present barbarous mode of conveyance which cannot otherwise be justified. But let us look at the fallacy of each separately, as this may throw some fresh daylight on the subject, and thereby enable railway companies to see their own interest for the future as inseparably connected with that of agriculturists and the general public.

First, We have had show cattle, both oxen and sheep, lie down and ruminate in a horse box when the distance did not exceed twenty miles. We have also had them feed when the time did not much exceed two hours—*i.e.*, they fed at their usual time when properly attended to. No doubt, in such cases, the animals were attended by those with whom they were familiar and at home. But we can also refer to examples where grass-fed cattle bought in in autumn for show-stock, and first-class breeding stock bought at public sales, have rested, ruminated, and fed in horse-boxes in the charge of strangers. Cattle are gregarious in their habits, consequently it is necessary that they shall be either in the society of each

other, as they are in stalls and feeding-boxes at the homestead of the farmer, or else be attended by some one in whom they have confidence; but, generally speaking, they will prefer the former—and this is what they would have in the railway trucks constructed on the above principle. Of course there are exceptions—nervous and easily excited animals—for which suitable provision should be made; for if a restless excited beast is put into a truck with seven quiet docile ones, the former one will keep the latter seven upon their feet, and “in a stir” throughout the whole length of the journey. Those who are not familiar with physiological peculiarities of this kind have but a very limited experience in the management and marketing of our live stock. But such, when practically considered, is much more against the objection than in its favour.

Excited and ill-tempered animals naturally should be confined in a close box by themselves, and upon a separate truck, so that they shall not be heard by the others, to disturb them. It must here be borne in mind that it is in the nature of gregarious animals to be aroused the moment any individual of the herd or flock gives the alarm; it follows, therefore, that the placing of an excited, or an excitable animal in a truck with seven peaceable ones, is ignorantly, it may be, but willfully using the most powerful natural means at command for keeping the whole in a state of nervous excitement, and even driving them into a fit of mad fury, that railway officials could possibly adopt. The too common maxim that the docile ones will tame the mad exception can only be received as a lame apology for the absence of that knowledge of the natural history of cattle that the exigencies of the case imperatively demand. It will no doubt be said *per contra* by the farmer, “it won't pay” to send excited animals to market in horse-boxes. But this belongs to the third objection, and, to avoid repetition, we shall dispose of it under that head.

The only practical conclusion that can be arrived at relative to the first objection is, that it must be set aside as untenable; and that, for the future, it will become more and more so, the farther we progress in the artificial management of cattle. There are no doubt a great many beasts that would not lie down in a railway truck during a short journey, or so long as they were able to stand upon their feet without experiencing pain or aching sensations from the exhaustion of nerve and muscle, or the confusion of the linings of the joints; but whenever they began to suffer bodily harm from standing they would naturally lie down, and the moment one tired ox or sheep went to bed the others would soon also follow the example.

It takes a great deal of muscular power to keep a heavy ox upon his feet, and the exhaustion is far greater than is generally credited. Some are even so little versed in the physiology of the matter as not to be aware that the heavy ox which they are loading so enormously with fat has to stand upon his feet by the antagonistic action of the muscles of the extremities, and that the fat-producing food now given weakens the con-

tractile power of the antagonistic muscles thus engaged. But if they would turn attention practically to the mechanical question involved, they could hardly fail to perceive the progress of mechanical truth as exemplified in the railway conveyance of fat stock, and the utter impossibility of proceeding much farther in the barbarous and unreasonable course now pursued of increasing the weight of fat, reducing the strength of muscles, and wedging up cattle (heads and tails) in a railway truck, so as to compel them, as it were, to stand upon their feet contrary to the laws of nature.

In refutation of the second objection, comparatively nothing requires to be said, as the sides of the partition of the trucks could easily be so stuffed with straw, and the bottom littered, as to prevent any harm similar to what is done, in horse-boxes. At present animals strike against each other, the extra fat defending the bones from serious harm, save in the case of the two outside beasts; but the practice involves a serious deterioration in the quality of the meat thus used as railway truck-stuffing to save the shoulder-blades, ribs, and hook-bones of our cattle. Economically considered, the practical question, therefore, resolves itself into the straw-stuffing proposed *versus* the beef and mutton live-manages of the present system; and its solution we may safely leave in the hands of the reader.

The last objection has reference to the extra expense which our proposition would incur. It may be granted, for example, that all our fat stock would be sent to the London markets in horse-boxes but for the extra expense. The argument, however, does not apply; for we aver that cattle could be conveyed on the plan we propose at the same price now paid, leaving railway companies as great gainers by the change as farmers, because a greater number of store cattle as well as fat beasts would be conveyed by rail, on the improved method proposed. The additional expense of the prime cost of the trucks would be nominal; and as they would be in daily use, and not much heavier than the present ones, the pecuniary comparison between them and horse-boxes, which are only now and then employed, falls to the ground. And granting that a fractional increase of price would be required to do justice to railway companies for the gain conferred upon farmers, the amount must be left an open question for experiment to decide. With regard to the case of excited beasts, they should be slaughtered and sent to the dead meat market. This is obviously the practical course of settling this question, for two reasons: for, first, it is a well authenticated fact that poisonous matter is sometimes generated in the blood of excited animals highly dangerous, such as ought to reduce the value of their meat to a nominal price; and second, if farmers will not slaughter such animals at home, it is unreasonable that a loss of 20s. per head should be sustained on seven beasts in order to save them the extra expense of a horse-box on one.

Steamboat conveyance we must defer to another article.

W. B.

MALTED CORN FOR CATTLE.

From time to time various experiments have been made with malted, ground, bruised, and steeped grain of every kind, in order to test which of these methods was the most profitable for utilising corn as feeding material for cattle in plentiful seasons when it is cheap, and when other feeding stuffs, as turnips, hay, straw, &c., are deficient in quantity or defective in quality, or both. In point of magnitude the question has been gradually extending its foundation wider and wider, until it has at length assumed dimensions that can hardly be circumscribed within measurable limits; for, let the price of bread corn be what it may, the fattening stock for the shambles and the cows giving milk must have and do receive corn daily; consequently the general solution of the economical problem of malt *versus* corn cannot any longer be postponed to a future and more convenient season.

Hitherto for the feeding of neat cattle and idle horses the malting of corn has carried the day in point of economy against its rivals, the bruising, grinding, and steeping processes. Rival experiments have often been nearly equally matched;

but when justice was done to the malting process, the taring of the scales has always indicated a decided advantage in favour of malt, even when experimentalists were greatly prejudiced to the contrary practice, and consequently not disposed to give it the smallest fraction more than fair play. For sheep the benefits have not been so generally in favour of malt. At the same time, when it is given in a proper form adapted to the peculiar requirements of this animal, whose dietary differs widely in many respects from that of the ox, experiments have been favourable. For pigs ground barley meal appears to be preferable, but only when used in the ordinary way. Experiments, however, are yet wanting in this department to prove the efficiency of ground malt when only used as a condiment in seasoning the barley meal, potatoes, and other kinds of feeding materials now consumed by swine. And the same observation applies to fattening poultry, and to seasoning the ground or bruised oats of farm and other working horses. In these latter cases justice has not been done to the economical use of malt as a condimental feeding material; while the

former examples, although successful, are nevertheless subject to many improvements.

The experiments with malt as a feeding material have been making progress in this country for upwards of a century. Reports of them will be found in the writings of Marshall, Young, Anderson, and others. In illustration we quote the following tabulated report of an experiment with fourteen bullocks, from the "Farmers' Dictionary":—

No. of Bullocks.	Weight.	Quantity of food consumed. Length of time 63 days.	Value of food.	Increase.
	st.		£ s. d.	st.
1	59	4½ coombs steeped beanmeal ...	2 4 4½	8
2	59	3 coombs 3 bush. malted beans...	1 17 6	11
3	59	5 coombs 1½ bushels malted beans and barley	2 11 0	14
4	61	5 coombs 1 bush. malted barley...	2 2 10	18½
5	62	4 coombs 3½ bush. steeped barley- meal	2 8 9	13
6	65	4 coombs 3 bush. dry barleymeal	2 7 6	12
7	68	4 coombs dry barleymeal	2 1 3	14
8	72	As many turnips as were valued at	1 1 0	11½
9	76	As many potatoes as were valued at	1 11 6	11½
10	88	4 coombs ½ bush. malted beans and 2 chaff	2 6 6	15
11	88	4½ coombs malted barley & chaff	2 12 1	1*½
12	89	4 coombs malted beans and chaff	1 19 4	14
13	92	4 coombs malted beans & potatoes	1 0 3	12
14	128½	4 coombs malted beans & potatoes	1 11 1	19½

"Average increase 13 stone each bullock in 63 days."

N.B.—"The beans and barley value at 2s. 6d. per bushel, and the potatoes at 6d. per bushel.

We quote the above experiment, not from its own intrinsic value, but to show what was being done in Arthur Young's time, and the progress then attained. It was not, however, conducted in a manner that can meet with the approbation of the present day, and, therefore, its use must be exclusively confined to its own date, the last century. At the same time its evidence in favour of the malting of barley and beans is by no means inconsiderable, affording ample encouragement for the further prosecution of the subject. The proportion of the articles in the mixtures is faulty, and also the kinds of articles mixed. And this applies to the majority of experiments that have been performed during the present century, so far as they have come under our personal observation.

Cattle require a far greater variety of articles in their daily food than is generally acknowledged by writers on the subject. A continuous diet of turnips and straw, for example, is injurious to health, although the majority of animals may soon become accustomed to it and lay on fat. If they have yellow turnips or swedes, with fine, sweet newly thrashed oat-straw, they may generally yield a passing quality of beef and mutton. The flesh is, with few exceptions, of a light bright red or red colour, which indicates a deficiency of the odorous and rapid properties of the meat of animals fed on richer food. If rich rye-grass hay with an abundance of clover is substituted for the oat-straw, the flesh assumes a darker red colour and a richer flavour. It is also of firmer texture, which proves that during life the animals enjoyed a higher degree of health. And if rich well-made meadow hay is given along with the swedes, the health and quality of the meat will be still farther improved. Oilcake, on the contrary, makes the meat softer, more oleaginous, and of a dirty yellow-whitish colour, owing to the hypertrophy of fat and atrophy of lean that take place in the fattening process. A small allowance of ground beans, peas, or oats produces a contrary effect from that of oilcake, by increasing the firmness of the flesh and the rich, blooming, pinky colour of the fat. Ground barley is somewhat inferior in both these respects; while barley malt, on the contrary, is superior, the quality of the meat, so far as we have been able to ascertain, approaching nearer to that of the rich upland grassings that are known or designated "good fattening grounds." And if these facts are seen in their

proper light, they point to the economy of a far greater variety of feeding stuffs than the general practice of the present time exhibits, for although certain proximate principles may be all very good of their kind, yet if other proximate principles are required to render them available in the natural laboratory of the animal economy, they are not alimentary, but excretory, and hence go to the dung-hill as manure. And this is not the worst of it; for when the excretory function becomes abnormal, or is abnormally performed, available elements go to the dung-hill that otherwise would have been utilized, while another portion of them go to the atmosphere in the form of gases.

Under such circumstances, or when the feeding materials are unnatural or deficient of certain elements to render them wholly available, and when the digestion, assimilating, and excretory functions are abnormally performed, a four-fold loss is sustained. *First*, for example, there is a sacrifice of health, with, eventually, a constitutional depreciation of the physical stamina of race; *second*, a decrease in the quality of the carcass meat sent to the shambles, and of the milk, butter, cheese, and other products of the dairy farm is experienced; *third*, a waste of feeding materials is sustained; and *fourth*, a considerable loss of manurial element also takes place.

The shortcomings of the present system of stock management are thus far from few in number, collectively considered, or of little weight when examined individually; and the practical question which we have to investigate is, How far will the use of malted corn enable the farmer to obviate the heavy losses thus sustained annually on live stock, manure, &c.?

If the use of malt will obviate the sacrifice now sustained as to health and degeneracy of race, the gain to stock breeders under this head would be incalculable. That its proper use would greatly improve health, and thereby to a certain extent effect this all-important purpose is manifest from the experiments already performed with it. That other elements are wanting in the ordinary feeding materials now given to cattle than those which well-made malt would supply, will readily be granted. To suppose malt an alexipharmic-food-panacea for all the ills to which live stock are subject, would be absurd, and equally out of date with the fallacious oilcake theories of the last half-century. During the last fifty years, for example, oilcake, in the general estimation of the agricultural public, has practically been used to supply all the shortcomings with which the ordinary feeding materials of the farm have been chargeable. Even at the present day how many farmers are there who would feel extremely cross if called in question to the contrary! Could anything be more ridiculously absurd than this? Those who thus advocate and practise do not comprehend the peculiar function which oilcake performs in the dietary of their cattle. In a similar manner intelligent farmers should openly and expressly avoid holding up malt as an article that will supply all defects in feeding materials. Generally speaking it may safely be said to supply elements that are wanting in the ordinary feeding stuffs; and that it therefore not only affords aliment directly to the system which otherwise would not be supplied, but that it also renders a greater per-centage of the ordinary elements available.

We have said, in the preceding paragraph, that by improving the health and general constitution of stock the gain to the farmer would be incalculable, owing to the prevalence of disease at the present time. This naturally leads to the pecuniary value of malt as a feeding material, and the narrow limit which many farmers unwittingly put upon it by saying that the malt-tax prevents its use. This is in the highest degree erroneous, as it sets down the profits of the farmer arising from the use of malt as equivalent to the amount of the tax upon malt; for if untaxed malt pays the farmer, and if taxed malt leaves him no profit, then his gain in the former case is either equal to or less than the tax. Neither of which is true, practically speaking; for various experiments might be quoted to prove that taxed malt has been used with profit even when barley was selling at a figure considerably above an average price—the profit gained being exclusively confined to the increase of carcass weight, or yield of milk, no allowance being made for improved health and constitution.

On the contrary, if such is the gain to farmers, it may be asked, Why do they not use taxed malt? If the health and

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* The increase in stones of bullock No. 11 is evidently a typographical error, the place of the unit figure being a blank.

constitution of their cattle can be improved, and those diseases so universally prevalent at present be obviated by the use of malt, and if the tax should leave them no profit as to weight, yet if they gain the former advantages as to health, why not do so?

The objection thus raised is one of the strongest arguments in favour of a total repeal of the malt-tax that can be advanced, as it shows how an injudicious tax obstructs the path of progress. Thus it is not so much the amount of the tax that has prevented its use, as the impracticable rules and regulations with which it is accompanied. At the same time, the tax when barley is high-priced forms a barrier not easily got over by practical men; for if malt cannot be used as a feeding material in dear years, it will never be so in cheap ones. In the latter an extra quantity of oorn may be consumed by stock, and in the former an allowance considerably below an average. But once admit malt as an equivalent element of health, and it must be used in dear years as well as in cheap ones, unless a substitute is found for it. Such being the facts of the case, the reader will readily perceive the practical force of the argument they involve, and the necessity of a total repeal of the malt-tax to obviate obstruction to much needed progress in this department of stock management.

The second head has a broader foundation, popularly considered as a public question. Thus if the use of malt improves the quality of beef and mutton, milk, butter and cheese, now consumed by the community at large, there is not an individual in the kingdom who is not deeply interested in immediately obtaining the total repeal of the malt-tax, and of having antiquated obstruction to the free use of malt as a feeding material for fattening stock at once removed out of the farmer's way. This requires almost no proof; for it would be more advantageous to consumers to pay the amount of the malt-tax twice over out of their incomes, than to continue being poisoned with diseased animal food as they now are; because the balance, after deducting any increase of income-tax, would be greater than at present. In other words, a reduction of the malt-tax would, upon the whole, increase their incomes by a greater reduction in their expenditure under other heads than the equivalent for the malt-tax would increase it, so that there would be a net balance in favour of better beef and mutton.

But, passing over this political view of the subject, an improvement in the quality of animal food is a national question of imperative importance, and there cannot be a doubt that the removal of the malt tax and the giving of malted corn to cattle is a practical step in realizing this desideratum. At the present time, therefore, it is evidently the duty of the legislature to remove every statutory obstruction out of the way, so as to enable farmers to improve the practice of fattening stock for the shambles and of feeding dairy cows. The old perille problem that "a pound of barley meal is equal to a pound of malt" is altogether below the advanced intelligence of the present day. It would be wasting ink and paper to show that the malting process produces a very great change in the constituent elements, and consequently that between the two, after this change in one takes place, there is not a legitimate comparison. In other words, farmers only make fools of themselves when they prove, or rather think they prove, unequal things—nevertheless equal to one another—by

experiment! It is high time that all such boeotic experimentalism was pook-pooked out of the agricultural world, and the more substantial data of modern applied science or experimental philosophy introduced, for the express purpose of investigating such tangible matters of fact as the quality of beef and mutton. No doubt, so long as farmers continue to handle these as they do "a pig in a sack," there will exist a voluminous mass of opinions in wild discord on the subject of degrees of comparison as to good and bad quality; but the go-a-head times in which they live are already getting beyond this non-practical method of arguing the question; for the dead meat or carcase trade is fast superseding this old "pig in a sack" rule, as under it butchers are not only able to distinguish quality with certainty, but also to select "the prime parts," as they are termed, and to avoid the inferior pieces. Consumers are also beginning to pay more attention to quality than they did some time ago, so that in a few years hence farmers may experience some difficulty in finding a market for oilcake-fed obese meat, similar to that with which shambles at present are everywhere overloaded.

The third head of our subject involves the waste of food experienced under the present practice of cattle husbandry. In other words, according to the popular expression, "cattle do not pay for their food." The question under consideration, therefore, resolves itself into the following: Will the proper use of malt enable fattening stock to pay for their food? That it will help to do so, is manifest from the facts already conceded, viz., that its proper mixture with the ordinary feeding materials of the farm will render a larger percentage of them available, even according to the imperfect experiments of the present practice; and as this practice is susceptible of very great improvement, it follows that its ultimate effects cannot as yet be definitely approximated. As yet, for example, it cannot even be said that the present process of malting barley for brewing is that which is most economical for cattle-feeding purposes. All that can be said at present is that the ordinary process of malting indicates a wide field of progress in the management of live stock both for the shambles and dairy purposes, but that statute law so effectually bars the gate as to render entrance to this promising field impracticable to farmers and dairymen.

On the fourth and last head, the waste of manure, very little requires to be said, practically speaking, from a general point of view. According to the old proverb: "You cannot take more out of a bottle than you put in, or than it contains," it follows that those who find more fertilizing element in the solid and liquid excreta of their cattle than the food contained, and who nevertheless boast of increasing the carcase weight amazingly at the same time, must of necessity belong to the light-fingered legerdemain section of society. The truth is, that in all cases where a large percentage of the elements of the feeding stuffs are not available as aliment a very great increase is sustained in the form of gases given off from the various excretory ducts of the body during the abnormal processes of digestion, assimilation, and defecation, whereas the changes that take place when these processes are normally performed do not give off gases. And as this is what the proper use of malt would effect, it follows that the manual resources of the farm would be economized by the practice.

AGRICULTURAL SHOWS IN THE NETHERLANDS, 1864.

Steamers and railroads, recently married in the Netherlands, begin to breed their accustomed stock—business in all directions, and not the least in the agricultural line. As yet no great international show can be expected where the net of railroads has too many holes to allow the produce to be easily gathered into one place easily attainable. But already several local shows are announced in different Dutch provinces for the summer of 1864, and he who begins to show his articles now in different places will make friends and customers for the not far-off period, when one general agent in some central place may be able

to dispose of a great lot of articles, so soon as their excellence and cheapness will be more known than at present.

Since a few years English agricultural machinery has been introduced by local agents, amongst whom I dare mention honourably John Boeke at Groningen, John Keyser & Co., Peignat & Co., both at Amsterdam, and several others.

With their wonted pluck, a great many spirited English manufacturers have lately preferred to bring their things themselves, or by their own travellers.

To each farmer who prefers a good, well-shaped, light, strong, and efficacious, intelligently-combined instrument to a miserable tool, these gentlemen are very welcome.

It must, alas! be allowed, that, as yet, a great many farmers in Holland do not see the difference between good and bad instruments. I believe the time has not yet come here for severe trials of implements; but it is come for extensive shows, where all the contrivances are seen at work. The technical education of the farming man has as yet to be made, and therefore you must put the things repeatedly before his eyes.

Let him handle them, examine them, see them and hear them; but do not as yet make him a *judge* over things of which he is, in a great many cases, nearly completely ignorant.

The Netherlands are not an absolutely poor country; the farmer works for the English market. It may be expected that the landlord and his tenant, seeing the machinery repeatedly at work, and everywhere, may open their eyes to the perception of their utility. It is not the first blow of the hammer that forges the iron in the desired shape: you must heat it repeatedly, and give multiple blows, hard and soft; but in the end, with energy and patience, you will find success, although the unwilling metal was rough and unwieldy in the beginning. So it proved last year at Haarlem, where, in the end, a great many numbers of the machinery were sold to the satisfaction of all parties.

Therefore I believed it will serve my English friends by publishing in the *Mark Lane Express* a general view of the different agricultural shows to be held in the Netherlands in 1864, with the names of their stewards, as follows:—

I. HARLINGEN, Friesland, June 8, 1864. Steamers with cheap fares from London and Hull to Harlingen. Steward, J. Huidehoper, Esq., Harlingen. Prizes: Horse-power thrashing machine £8; corn dressing and winnowing machine with complete set of sieves, £2 10s.; corn and seed drill, adapted to be worked with one horse on ridges 8 feet wide, £4; ridging plough, 16s.; horsrake, £2; haymaker, £3; chaffcutter for one man, 16s.; the best set of hay and dung forks, 16s.; mangold cutter, 8s.; oat crushing and bean mill, 16s.; machine for beating and swinging flax, £8; the most complete set of agricultural implements and machinery, £12 10s.; second set, £4.

II. ZIERIKZEE, Zealand (a port near Rotterdam), June 13, 1864. Cheap inland vessels from Harlingen to Zierikzee. Steward, A. W. Feding van Berkhout, Middelburg. Prizes: Best corn and seed drill, £4; horschoc, £3 7s.; ridging plough, 16s.; mowing machine, £8; haymaker, £2 6s.; horsrake, £2; harvest cart, £1; wagon, £1; set of manual implements connected with the produce of the soil, £2 10s.; dynamometer, £4; horse-power thrashing machine, £3; corn dressing machine, with set of sieves, £2; for new or improved machinery not mentioned in this list, medals; machines for beating and swinging flax, £1 13s.

III.—LAKE OF HAARLEM; great annual meeting or congress of Dutch agriculturists, June 23, 1864. Market for implements. Steward, J. P. Amersfoorde, Esq. This market, to be held in an extensive *golder* or recently-drained lake, full of cornfields and meadows, seems a proper place for showing implements at work. Already Fowler's steam plough and Clayton and Shurtleworth's, as well as Ransomes and Sims' great thrashing engines travel through the lake, and a good sale may be expected in this market.

IV. ZWOLLE, or DEVENTER, Overijssel, July, 1864. Steward, T. P. G. Moorrees, Deventer. The Overijssel Agricultural Society is in a state of dissolution, so it cannot at present be mentioned in what town its show shall be held. The steward will give further information. Perhaps more than one show may be expected in this part. The

railway from Utrecht to Zwolle will be complete in July, 1864. Fair at Zwolle July 29.

V. HARDERWYK, Guelderland, Aug. 9, 1864. Steamers from Hull to Kamper and Zwolle. Steward, A. W. Hoetz, Esq., Harderwyk. No prizes for machinery have been promised for this year, the show being a cattle show. Harderwyk is a sea port, and has its railroad since 1863, connecting it with Zwolle. The immediate neighbourhood is sandy and poor, but the land behind it produces rye and buckwheat. On the heaths here a steam plough would be the true implement. Artificial manures, also, must be very welcome here.

VI. LEYDEN, South Holland, September 19 to 24, 1864; accessible by rail and by water from Rotterdam or Amsterdam. Steward, Gevers Deynoot, Rusthoek, near the Hague. Prizes: Collections of implements, £16, £8, £4; best plough, 16s.; best harrows, 16s.; best drill, £4. A trial of drills is to be held at Endegeest, a park near Leyden; proprietor, Sir Gevers, of Endegeest. Corn reaping machine, £1 10s.; grass mower, £1 10s.; haymaker, £1; horsrake, £1; steam thrashing machine, £4; horse thrashing machine, £2; straw cutter for horse power, £1; straw cutter for hand power, £1; hay cutter, £1; mangold wurzel cutter, £1; collection of horse-shoes, £1; cheese press, £1; cheesemaking machine, £1; artificial cow-milker, £1; machine for beating or swinging flax, £4; collection of hand-tools for gardeners, £1; drains, £1; lubricating oils, 6s.; garden ornaments, 6s.; peat, £1; manure, £1.

A look on this time table may show that a man can begin at Harlingen and finish at Leyden, visiting all the shows (and perhaps some neighbouring fairs into the bargain). If he has the good luck of selling his machinery at the first shows, he may get new samples sent to him by his principals from England *via* Rotterdam, to which town steamers run daily from Hull, Harwich, London, and other English ports.

It is advisable to bring with the English horse-power implements a complete set of horse-harness. The Dutch stye of harness is not adapted for English machinery, and the absence of efficacious harness might peremptorily prevent a fair trial. No doubt cheap plain English harness could be sold with the machinery.

It is also advisable to bring the accessories for the implements, a hammer, screw-key, turn-screw, some corn, or anything else wanted for showing machinery at work. All these can easily be packed in the cases with the machinery, and cost a lot of money when they must be procured for the show in an out-of-the-way place at a given moment.

As yet no entrance money is expected in Holland from the exhibitors; but since only at Leyden they will find tents, it will be a great comfort to them if they bring their own tabernacle with them.

A traveller for some great factory or an agent for several firms would do well to make an agreement with a captain of an inland *tjalk* or *galiot*. These craft are mostly built at Groningen; they take their freight at Harlingen, in which places Messrs. Hurdehoper or Boeke could introduce parties to the skippers.

These vessels can reach all the show places at small cost; the skipper sailing, with the help of his wife and children, generally lives cleanly and soberly in his ship. If the exhibitor could make a contract for the whole season he would find, very likely, accommodation at a cheap rate, the more because he could always dine and sleep in his own cabin, and avoid the hotels of crowded small country towns. These skippers are generally clever and honest folk; they are good sailors, and go anywhere; the larger vessels may pass the Channel and come to London or Hull; the Friscan *eel vessels* may be seen every week on the Thames.

These sailors are apt at their business, travelling generally with tents for theatres and such like from one fair to another in all the towns of Holland. Their ladies are famous for wafles and warm spiced wine (what they call *bishop*), as Mrs. Primrose was for goose-pie and goose-

berry wine. I should only advise young agents not to look too deep into the eyes of their fair daughters with the golden caps. this sight-seeing has sometimes proved to be dangerous and attacking.

AMERSFOORDE.
Lake of Harlem, March 6th, 1864.

BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

A monthly meeting of the Council of this Society was held at the Railway Hotel, Taunton, on the 5th instant. Sir J. T. B. Duckworth presided, in the absence of Earl Fortescue. There were also present Colonels Acland and Luttrell, Rev. T. Phillpotts, Drs. Brent and Gillett, Messrs. Adair, C. Bush, R. H. Bush, R. G. Badoock, R. H. Clarke, J. H. Cotterell, J. T. Davis, E. S. Drews, R. Dymond, J. Fry, Jonathan Gray, R. Neville Grenville, J. Gould, J. Hole, J. D. Hancock, J. E. Knollys, J. Lush, G. S. Poole, S. P. Pitts, H. Williams, W. Wippell, H. St. John Maule, and J. Goodwin.

BRISTOL MEETING.—The SECRETARY reported that the Local Committee of the city of Bristol had paid to the Society's Treasurer the whole of the sum of £1,000 promised towards the expenses of the meeting in June next.—A letter was read from Mr. D. Burgess, jun., on behalf of the Downs Committee, acknowledging the receipt of an undertaking on the Society's behalf with reference to the temporary occupation of a portion of the Downs, and granting permission to the Society to fill up the cavities in the intended site of the show.

STOCK PRIZES.—CONDITIONS OF COMPETITION.—A letter was read from Mr. E. Bowly, of Siddington House, near Cirencester, announcing that his short-horn heifer, placed second in class 11 at the Exeter meeting, had produced a calf at the proper time, and asking that, if Lady Pigot was not in a position to give a like certificate with reference to her heifer, the first prize should revert to him (Mr. Bowly), in accordance with the practice of the Royal Agricultural Society. —The Secretary was directed to write Mr. Bowly in reply that, under present conditions, he is entitled to a second prize, but the subject of his letter should receive the consideration of the Stock Prizes Committee.—A letter from Mr. George Turner, of Beacon Downs, announced that the in-calf heifer with which he won a second prize at the Exeter Meeting died some time ago, and asked if, under the circumstances, he was entitled to the prize?—After a full consideration of the circumstances, it was resolved that a letter be written to Mr. Turner informing him that, as the conditions with reference to calving had not been complied with, the prize could not be paid.

TIME OF SHEARING SHEEP.—A letter was read from Mr. E. W. Moone, of Coleshill, near Highworth, on the subject of the proper time for shearing sheep for exhibition, but it was held that, as the prize lists have gone out, no alterations can be made for the present year.

SUPPLY OF REFRESHMENTS AT THE BRISTOL MEETING.—As Mr. Holmes, the contractor, is a bankrupt, and his trade assignee has declined to carry out the contract in his official capacity, the subject was referred to the Contract Committee, with a view to their taking immediate steps to obtain fresh tenders.

HONITON LACE.—MR. HERBERT WILLIAMS moved, "That for the improvement of the art of lace manufacture, and to enable the makers of the so-called Honiton lace to compete with other markets, the Society will place at the disposal of the Arts Committee a sum of money not exceeding £20, to be given for the best designs of sprigs, bouquets, and pieces of work, subject to such regulations as may hereafter be considered useful to attain the objects in view." On introducing the subject to the attention of the Council, Mr. Williams stated that the hand lace trade of the county of Devon, though capable of affording employment to a large number of females, was at present in a very bad state; and unless energetic steps were taken to improve or renovate it, it would be entirely lost, as it had been from the neighbourhood of Blandford, where it was originally established. In the exhibition of 1851 some lace of very good design and quality was shown, and this, for a time, led to an extension of the trade. Gradually, however, a very inferior article, known as single lace, had found its way into the market, and it was with the

object of correcting this evil, and of raising the general standard of quality and design, that he proposed to institute two classes of prizes—one for single designs, such as sprigs of flowers, &c., exhibited by workers, as they are known in the trade; and the other for pieces of work, of more complex design, shown by factors. Mr. Williams followed up his remarks by exhibiting some specimens of ordinary work, which contrasted most unfavourably with other specimens produced from designs drawn directly from nature.—A long and very interesting discussion ensued, in the course of which the policy of offering the prizes was considered in a moral, social, and economical point of view, and ultimately the resolution was carried unanimously, one of the speakers remarking that if by this means the ladies of the West of England could be induced to take an increased interest in the occupations of their sisters who were now toiling for a bare pittance, great good must ensue.

SUBSCRIPTIONS IN ARREAR.—A number of members whose subscriptions were in arrear for three years or upwards were ordered to be struck off the lists, in accordance with the notice given at the last meeting.

BRISTOL MEETING.—LOCAL PRIZES.—A letter was read from Mr. Proctor Baker, honorary Secretary to the Bristol Local Committee for receiving the Society in June next, announcing that they had voted the following amounts to be given as special local prizes, subject to such conditions as the Council might see fit to enforce:—

CATTLE.—For the best bull, cow, and offspring, the calf not to exceed six months in age, £15; second ditto, £10. For the best bull-calf of any breed, above five months and under twelve months old, £10; second, £5. For the best heifer-calf, ditto, £10; second, £5. *Shropshire Down Sheep.*—For the best yearling ram, £10; second, £5. For the best ram of any other age, £5; second, £3. For the best pen of five two-tooth ewes of the same flock, £5; second, £3. *Other Classes.*—For the best ten long-wool couples in the wool, of the same flock, £10; second, £5. For the best ten short-wool couples, ditto, £10; second, £5. *Entire Horses.*—The Society of Merchants, at the request of the Committee, have offered £50 for the best cart stallion, not of the Suffolk breed, to cover in the season of 1865, in the district, within twelve miles of Bristol, and to attend in Bristol every alternate Thursday, the fee not to exceed two guineas for each mare.

Mr. R. H. BUSH, in allusion to the foregoing offer of £50 by the Society of Merchants, expressed a hope, on the part of those giving the prizes, that there would be good competition among the Clydesdale stallions, an animal of that breed being much wanted in the neighbourhood.

COMMENCEMENT OF THE BREEDING YEAR.—MR. KNOLLYS called attention to a letter on this subject by Mr. Duckham, editor of the Hereford Herd-book; and considering, as he (Mr. Knollys) did, that unanimity of practice was desirable, wherever it could be agreed upon by different societies, he gave notice that on an early day he should call the attention of the Council to the propriety of considering in what way a uniform system of calculating the age of animals could be adopted by the various societies, so as best to promote the interests of agriculture.

A vote of thanks was passed to the Highland and Scotch Agricultural Society for the presentation of a complete set of the new series of their Transactions; and the Secretary was directed to take care, on the part of the Bath and West of England Society, that a regular interchange of the publications of the two Societies should be maintained.

NEW MEMBERS.—Mr. J. Bingham, 28, Parliament-street, Westminster; Mr. A. C. Wheeler, Kingsholme, Gloucester; Mr. J. Hatherell, Oldbury-on-the-Hill, Chippingham; Mr. E. W. Churton, ditto; Mr. W. M. Bailie, Marlborough-buildings, Bath.

THE RISE AND PROGRESS OF THE STUDLEY, KILLERBY, AND WARLABY HERDS OF SHORT-HORN CATTLE.

Sir,—In submitting the following imperfect outline of the history of these important herds to the public, my only fear is that the graceful, but too flattering announcement of my forthcoming sketch, which appears in the very interesting introduction to it from the pen of my friend Mr. Storer in your magazine of last month, may have led to higher expectations than I am at all able to fulfil. It is not without much diffidence that I have undertaken this task. It has, however, no higher pretension than to chronicle in order the principal facts and events which have conduced to the present pre-eminence of the Warlabby herd; to which I have added, I trust in no dogmatic spirit, a few remarks on such of them as appear to illustrate the science of breeding, concluding with some general observations on the principles which seem to have guided the Messrs. Booth in effecting those gradual modifications of form and character in their cattle, which have now become the distinctive and established traits of the Warlabby Shorthorn. I have only to add that the data (for which I am largely indebted to my friend Mr. Bruere) have been authenticated by Mr. Booth.

Previously to the year 1790 Mr. Thomas Booth, who was then the owner of the Warlabby and Killerby estates, and farmed them both, commenced the breeding of Short-horns, and laid the foundation whereon has been built the name and fame of Booth. For half-a-century previous to that time a race of cattle, existing on the banks of the Tees, which were supposed to be indigenous to the adjacent districts, and had long been especial favourites of the border forayers, had excited the attention of the early improvers of horned stock, as affording favourable materials from which to make their selections. Under the auspices of several enterprising country gentlemen, foremost among whom were Mr. Milbank, Sir William St. Quintin, and the Hutchinsons, these Teewater Shorthorns had undergone gradual, but not very systematic, improvement until the days of the Collings, who were contemporary with Mr. Thomas Booth. The most favourable specimens of the breed were wide-backed, well-framed cows, deep in their fore-quarters, soft and mellow in their hair and "handling," and possessing, with averaging milking properties, a remarkable disposition to fatten. Their horns were rather longer than those of their descendants of the present day, and inclining upwards. The defects which Mr. Thomas Booth detected, and determined to correct in these cattle, were such as still betray the unimproved Shorthorn. They were chiefly those of an undue prominence of hip and shoulder point, a want of length in the hind-quarter, of width in the floor of the chest, and of fulness generally before and behind the shoulders, as well as of flesh upon the shoulder itself. They had a somewhat disproportionate abdomen, a too lengthy leg, and a want of substance, indicative of delicacy, in the hide. They failed also in the essential requisite of taking on their flesh evenly and firmly over the whole frame, which frequently gave them an unlevel appearance. There was, moreover, a general want of compactness in the conformation of the animal.

Mr. Thomas Booth obtained his rudimentary stock from some of the best specimens of these Teewater Shorthorns. He appears to have proceeded on the principle, that whilst the general similitude and mingled

qualities of both parents descend to the offspring, the external conformation—subject, of course, to some modification by the other parent—is *mainly* imparted by the male, and the vital and nutritive organs by the female. Acting on this hypothesis, he was careful to select such well-framed cows only as evinced by an ample capacity of cheat a robust constitution, and a predisposition to fatten, and such moderate-sized males as possessed in the highest degree then attainable the particular external points and proportions he deemed desirable to impress upon his herd. A dairy farmer under Lord Harewood, a Mr. Broader, of Fairholme, in the parish of Ainderby, appears to have possessed some cows having the qualifications required. Tradition speaks of them as unusually fine cattle for that period; good dairy cows, and great grazers when dry; somewhat incompact in frame, and steerish in appearance, but of very robust constitution. Previously to the year 1790, Mr. Thomas Booth had bought some calves from these cows: Strawberry Fairholme, Hazel (*i. e.* flecked roan), Fairholme, and Eight-and-twenty-shilling Fairholme, purchased from Mr. Broader's farm, have the honour of being the ancestresses of several illustrious families of Shorthorns.

We have said that Mr. Thomas Booth selected *moderate-sized* males. His observant eye had recognised as indispensable to any improvement in the asymmetry of these Teewater animals the necessity of reducing in size and stature their large, loosely-knit frames. With this view he decided on selecting his bulls from the stock of his contemporaries, Messrs. Robert and Charles Colling, who had themselves, to some extent, effected this reduction of size, and improvement of form and fattening capacity in their stock, chiefly through the use of Hubback, a small short-legged bull. Twin Brother to Ben (660), bred by the Collings, and Son of Twin Brother to Ben, were the first Bulls used by Mr. Thomas Booth to these Fairholme heifers. These bulls had the short legs, the long and level hind quarters, the firm backs, and good twists, which Mr. Thomas Booth attached so much importance to, and their offspring amply testified to his discrimination. It is recorded that one cow by the former, and her daughter by the latter bull, produced six calves in one year, the dam having twice produced twins, and the daughter once. Four of these calves were heifers. Some of the offspring were very superior cows. In proof of the excellent foundation they afforded for the formation of a herd, it is affirmed on high authority that one of the Twin-Brother-to-Ben cows produced a cow by Son of Twin Brother to Ben, quite equal to Faith by Raspberry, the dam of the famous Hope. Many of the cows were deep milkers, but running dry sooner than was then usual, when they gained flesh very rapidly. The late Mr. Ewbank, of Sober Hill, questioning the milking capacity of some of them in this condition, Mr. Thomas Booth pointed to their broad backs, and exclaimed—"Look there! that is worth a few pints of milk!" These cows were further open to Mr. Ewbank's criticism as having *raw* noses, as he contemptuously termed that feature when flesh-coloured; alleging that in his early days the farm stock was nearly all *black-nosed*, and that he never knew a raw-nosed cow that was not delicate. This prejudice is not without a parallel in our

one day, in the prevalent idea that *white* cattle are constitutionally weaker than others. It should be remembered that the indigenous cattle of these islands were white, and that, doubtless by a wise provision of nature, the offspring even of dark-coloured domestic animals, transferred to northern regions, grow white in two or three generations.

Having thus judiciously selected the best animals procurable of both sexes, Mr. Thomas Booth was careful to pair such, and such only, of the produce of these unions as presented in a satisfactory degree the desired characteristics, with animals possessing them in equal or greater measure, and unsparingly to reject—especially from his male stock—all such as were not up to the required standard. Having by these means succeeded in developing and establishing in his herd a definite and uniform character, he sought to ensure its perpetuation by breeding from rather close affinities, as in his opinion the only security for the unflinching transmission, and transmission in an increased ratio, of these acquired distinctions to the offspring. In tracing the pedigrees of these herds, it will be seen that, from the earliest period, the same system of breeding from close relations which was pursued by the Collings was followed by the Booths. An examination of the pedigree of Lady Maynard (*alias* the cow Favourite) will show to what a length the system was carried by the early breeders, and how closely the first families of the Colling strain were allied to the Booth tribes. Further proof of this may be found in the pedigrees of the earliest bulls used by Mr. Thomas Booth, viz., Twin Brother to Ben, Suworrow, Albion, Pilot, and Marshal Beresford. Thus Twin Brother to Ben was the own uncle of Red Rose by Favourite, the dam of Pilot, and Red Rose is own sister of Styford, the sire of Suworrow. Suworrow was by a son of Favourite, and his dam was by Favourite. Albion—purchased at Mr. Charles Collings' sale in 1810, and an excellent sire—was by a bull which was both a son and grandson of Favourite; his dam was by a son of Favourite, and his grandam by a son of Favourite. Pilot, bred by Mr. Robert Colling, was by Major or Wellington. Major was by a son and grandson of Favourite, his dam by a son of Favourite, his grandam by Favourite, and his great grandam by Favourite. Wellington was by a son and grandson of Favourite, and his dam by Favourite. Marshal Beresford was by a son and grandson of Favourite, his dam by a grandson of Favourite, and his grandam by Favourite. This latter bull came into the herd in an exchange for some cows with Major Bower, Mr. Thomas Booth's brother-in-law, and a shorthorn breeder, then living at Welham. On returning home one day, Mr. R. Booth found, to his great annoyance, that his father had resold the Marshal to Major Bower. He thought that if either had been parted with it should have been Albion. It proved fortunate, however, for the Booth herd that Albion was retained; for though not so stylish as the Marshal in appearance, he proved far superior to him as a sire. Albion is said to have done more good in the herd than any other of the earlier bulls, notwithstanding that he had, through Washington (874), *the alloy*, which was the term of reproach cast upon Lady by Grandson of Bolingbroke and her descendants in the early days of shorthorn breeding. The offspring of Albion were, in general, very round, compact, and near the ground.

We must here, however, revert to the Fairholme calves. A slight survey of the tribes which have sprung from these early mothers of the herd may not be without interest to some of your readers. From them proceeded the Fairholme or Blossom tribe, the old Red Rose tribe, and the Ariadne or Bright Eyes tribe.

Of the Fairholme or Blossom tribe, one branch terminated in the bull Esby (232). Another, which Mr.

R. Booth took with him to Studley, produced Moss Rose by Suworrow, Madame by Marshal Beresford, Fair Maid by Pilot, Miss Foote by Agamemnon, and Young Sir Alexander. A third division, which, in the cow Eve, passed into the hands of Major Bower, has representatives in the herd of Lord Faversham—Sky Rocket, the first prize bull at the Royal show at Leeds in 1862, being one of them. Of a fourth branch—the descendants of Beauty by Albion—one portion remained in the hands of Mr. John Booth, and produced Modiah, sold to Mr. R. Holmes (who bred her from Belson); yet other passed into the hands of Sir Charles Knightley, who had at one time several representatives of it. From a fifth branch, retained by Mr. Thomas Booth, sprang Twin Cow by Albion, her son Navigator, whose spirited portrait adorns the walls of the dining-room at Warlaby, and a long array of prize animals, amongst which may be mentioned Bloom, Plum Blossom, Nectarine Blossom, Venus Victrix, Baron Warlaby, and Windsor.

The old Red Rose tribe is extinct, except in the progeny of Julius Caesar and Balahazzar.

From the Bright Eyes tribe, in the possession of Mr. R. Booth, at Studley, came Ariadne, the prize cow Anna by Pilot, and many other fine animals dispersed at the Studley sale.

Besides these Fairholme tribes, there was the Hahnby or Strawberry tribe, which also dates from this period. The first of them was of that yellow, red, and white hue, which, though out of favour at the present day, was then the prevailing colour of the shorthorn. She was bought in Darlington market, and one of the earliest recollections of Mr. R. Booth was of that cow coming home. The type of old Hahnby of 1797, who is said to have been a very finely-made cow, has often been reproduced in her descendants in the herd. Mr. Thomas Booth considered this as one of his finest families, quite equal to the Blossom and the Ariadne tribes. Young Albion (15) is the first bull of note in the Hahnby family. He was much used in the herd, and was one of the first that was let out on hire. He went to Mr. Scroop's, of Danby Hall, near Middleham, who had a fine, large, robust herd of cattle, related, through some of the bulls used, to the Colling blood. In 1812, the Squire of Danby challenged Mr. Thomas Booth to show, "for rump and dozen" (the usual stakes at that day being rump steaks and a dozen of wine) the best lot of heifers he had, against the same number of his own, the match to be decided at Bedale. Although a good lot, the Danby's had to give place to the Killerby and Warlaby contingent. Of the Hahnby tribe, of which we were treating, came also the bull Rockingham, and Priam, the sire of Necklace and Bracelet. The only female representatives of the family are in the hands of Mr. R. Booth. From his Strawberry 3rd came the Bianca and Bride Elect branch; whilst the famous cow White Strawberry, the dam of Leonard, was the ancestress of Monk, Medora, Red Rose, and her daughters, the queenly quartette. Young Matchem (4422) is descended from White Rose, own sister of Young Albion, and therefore, on the dam's side, of the Hahnby family, and the same branch of it gives the dam, Young Rachel, of Mr. Ambler's Grand Turk.

The Bracelet tribe are sprung from a cow by Suworrow, of whose origin there is no record. She was the ancestress of a very superior cow, calved in 1812, Countess by Albion, the alloy bull, also of Toy, and her twin daughters Necklace and Bracelet, and of Col. Towleley's Pearly, and Mr. Torr's Young Bracelet, tribe.

The early representatives of the above-mentioned tribes formed the herd of Mr. Thos. Booth down to the year 1814, when Mr. Richard Booth, taking the Studley farm, near Ripon, left Killerby. Mr. Thomas Booth was at this time the most enterprising and skilful im-

prover of cattle in his district, if met of his day. It is said there were in Mr. Thomas Booth's herd of that period some cows as good as any herd of the present time can boast; though, being bred for use rather than show, the generality of them were wanting in the refinement of the modern shorthorn. At that period there were, happily, no shows to demand the sacrifice of the best cattle in the kingdom, or the few that were held could be reached by the majority of cattle attending them only by such long journeys on foot as would be impracticable by animals in such a state of obesity as is now a *sine qua non* with the judicial triumvirate. High feeding at that time meant no more than good pasture for cows early dried of their milk; and the term "training" was never heard except in relation to horses. The first breeder who introduced the system, which has since run into such ruinous excess, of house-feeding cattle in summer on dry food, was Mr. Crofton, of Holywell; and in that year he, of course, took all before him. The general treatment of the females of a herd at that day was a simple hay diet during the winter months. They were put early to breeding, and generally calved at two years old. A few were taken from the lot to milk. The remainder suckled their calves until winter. They were then taken up, dried, and fed off by the time they were three years old; the same course being pursued, in their turn, with their progeny.

Mr. Thomas Booth was as liberal as his successor in allowing the free use of his bulls to his poor neighbours; and, like most public benefactors, was occasionally imposed upon: a ludicrous instance of which tradition preserves. An old fellow at Ainderby, not contented with the bull which was allowed to be used, and being very anxious to have a calf by another, that Mr. Booth especially prized, and kept exclusively for his own herd, took his cow into the lane adjoining the field where the bull was. The bull broke through the fence; and—the old sinner's purpose was accomplished. The latter, knowing how indignant Mr. Booth would be, thought it safest to act on the principle of taking the bull by the horns; and, assuming an injured air, repaired at once to him, exclaiming, "O, maister, maister! sic on a thing has happened! Your gart ugly beast has broken through t'hedge, and I doubt he'll has gitten my cow wi' corf. Its a sad loss: I were bound to feed her off."

Mr. Richard Booth's removal to Studley forms a new era in the history of these herds. From 1814 down to its dispersion in 1834, the Studley colony took precedence of the parent stock; and we shall now, therefore, before proceeding with the history of the Killerby Herd, turn our attention to that of Studley.

THE STUDLEY HERD.

Mr. Richard Booth inherited with his father's name his full share of his father's skill as a Breeder, with an equal fondness for the pursuit; and his new farm which he held under the wealthy and well-known Mrs. Lawrence, was speedily stocked with first-class shorthorns. He began with his father's cattle, and carried on to even greater perfection his father's work. Among the first importations which were made from Killerby to Studley, when Mr. Richard Booth went there in 1814, the following may be mentioned:—He purchased from his father Bright Eyes, by Lane Bull, and her daughters Ariadne, then a two-year-old, and Agnes, a yearling, both by Albion. Ariadne was own sister of Agamemnon, the grand sire of Isabella by Pilot. She was the dam of the famous Anna, by Pilot, who won numerous prizes at the best shows of the day; and who, in 1824, performed the feat of walking from Studley to Manchester, taking the first prize there, walking back, and

producing within a fortnight Young Anna. Anna is said, by those who well remember her, to have borne a very strong resemblance in colour and character to Queen of the Ocean. She was the dam of Adelaide, who, through her sire Albert, was also granddaughter of Isabella. Adelaide was the highest priced female sold at Mr. R. Booth's Studley sale in 1834, and was the grandam of Mr. Storer's cow Princess Julia. From Anna, more remotely through her daughter Young Anna, are descended two of Mr. Torr's families; and from Agnes, daughter of Bright Eyes, came Mr. Fawke's Verbena and her descendants. Agamemnon, the own brother of Ariadne, was a bull of extraordinary substance, with good hind quarters, heavy flank, deep twist, and well covered hips. He was eventually sold, with two heifers, to Mr. White, of Woodlands, near Dublin. Even in these early days Mr. Booth had bulls out on hire. Alonzo, a son of Ariadne, by Rockingham, was let to Mr. Hutton, of Marske, who, to promote the improvement of the breed of cattle in his district, had at that time yearly shows on his estate. Protector, another bull of the Bright Eyes family, was hired by Mr. Powlett, of Bolton Hall. He was a large red bull, and a capital sire.

In the first year of his residence at Studley, Mr. R. Booth bought in Darlington market the first of what was afterwards known as the Isabella tribe. She was a roan cow, by Mr. Burrell's bull of Burdon, and, for a market cow, had a remarkably ample development of the fo quarter. She was put to Agamemnon. The offspring was "White Cow," which, crossed by Pilot, produced the matchless Isabella, so long remembered in show-field annals, and to this day quoted as a perfect specimen of her race. Pedestrians crossing the fields to the ruins of Fountains Abbey might generally see her and Anna, perhaps the two best cows of their day, with a blooming bevy of fair heifers, attended by Young Albion; and many a traveller lingered on his way to admire their buxom forms, picturing to himself perhaps how the monks of the old abbey would have gloried in such bees. Isabella was the Rev. Henry Berry's beau ideal of a shorthorn. In 1828, Sir Charles Morgan having offered a premium to promote a trial of merit between Herefords and Shorthorns, Mr. Henry Berry wrote to the editor of the Farmers' Journal requesting him to give publicity to the following offer: "I will produce as a competitor for Sir Charles Morgan's premium at Christmas next a Shorthorned cow, then nine years old, expecting to drop her *eighth living calf, at separate births*, in June now next ensuing, against any Hereford in England, seven or nine years old, having had calves for years in the same proportion. I will also on the same occasion produce a Shorthorn heifer, three years old, having had a living calf, allowing to the Herefords the same ample scope—all England—for the production of a competitor. It will be obvious to your readers that in thus pitting two individuals against so numerous a tribe as the Herefords, I must entertain considerable confidence in their merits, and it will be as easy to draw a correct conclusion should my offer not be accepted." The cow and heifer which, by permission of the owners, Mr. Berry proposed bringing into competition with the Herefords were Mr. Whitaker's cow Moss Rose and Mr. R. Booth's heifer Isabella by Pilot. The challenge was not taken up.

Isabella and her descendants brought the massive yet exquisitely moulded fore quarters into the herd, and also that straight under-line of the belly, for which the Warlaby animals are remarkable. That such a cow should have had but three crosses of blood is striking evidence of the impressive efficacy of these early bulls, and confirms Mr. Booth's opinion that four crosses of really first-rate bulls of sterling blood upon a good market cow, of the ordinary Shorthorn breed, should suffice for the production of a Shorthorn fit to compete with the possessors of twenty

quarterings. And, indeed, in later times, Mr. Booth's cow Princess Elizabeth, the dam of Queen of the Isles, and her sister Princess Mary, abundantly verified the truth of this tenet. Nor can many herds boast of a better Shorthorn than was Mr. Booth's cow British Girl, though only third in descent from a red Galloway cow. She was level, round, and compact, and had very graceful fore-quarters. In British Girl's daughter, British Rose by Prince George, and her granddaughter Wild Rose by Lord of the Valley, though reared as hardily and frugally as West Highlanders, the visitor to Warlaby will find all the excellences that mark the high-caste Shorthorn. They more than verify a remark of Mr. Robert Colling's, after the sale of his own and his brother's herds: "Give me," said he to Mr. Wiley, of Brandsby, "my sight and my touch, and in half-a-dozen years I will produce as good a herd as I or my brother have sold off. I would do this by the use of well-bred bulls on good market cows." In such examples as these there is much instruction and encouragement for tenant farmers desirous of improving their stock. Female Shorthorns of high pedigree are in general beyond the reach of their class; but if near neighbours would only club together, and procure for their joint use a succession of pure bred males, of fixed and determinate character, the improvement which would, in a few years, be effected in their stock, especially as regards both early maturity and tendency to carry flesh, would be such as materially to enhance their farming profits. It is often difficult, however, to convince even those amongst them who have used, and experienced the benefits resulting from the use of, a high bred sire, of the expediency of *continuing* in the same course. Some wretched cross-bred cow put to the "pedigree bull," probably produces a bull-calf with all the characteristics of its sire, all the more probably, perhaps, from her being of no determinate character herself. This the farmer rears on something better than blue milk, in the hope of getting a prize or two with him at local shows, nine out of ten of which absurdly ignore the first desideratum in a sire, pure descent, the bull of one cross being allowed to compete with the possessor of half-a-dozen. The mongrel gets the white ribbon, and immediately becomes, in his owner's estimation, endowed with every necessary qualification for a sire. The farmer thenceforth uses him to his own cattle and perhaps those of half the neighbourhood. The result of this retrograde step is soon apparent in the stock. Interesting traits of the maternal ancestry of the *parvenu* bull re-appear in his progeny—the brindle, it may be, of Pat O'Flanagan's Kerry, or the black nose and horns of Sandy Macpherson's Klyoe, or the long legs and flat sides of Taffy Owen's Glamorgan. But though the farmer sees that he is rapidly losing all the ground he had gained, and that his stock has ceased to be sought after, he rarely admits the cause.

"White cow," by Agamemnon, produced, besides the famous Isabella, "own sister to Isabella," and Lady Sarah, and was then sold to Mr. Paley, of Gledhow. Her dam, the Darlington cow, had been previously disposed of to the master of a boarding-school at Ripon, one of whose pupils, Mr. Bruere, of Braithwaite Hall—a highly esteemed friend of Mr. Booth's—well remembers the brimming pails of milk she gave. "Own sister to Isabella" was the dam of Blossom, by Memnon (a son of Julius Cæsar and Strawberry by Pilot), and Blossom was the dam of Medora, by Ambo, one of the neatest cows Mr. Booth ever bred. Medora was sold to Mr. Fawkes, in whose hands she was the progenitress of his Gulgare, Haidee, Zuleika, and others, Mr. Fawkes' Lord Marquis, the first prize three-year-old bull at the Royal at Lewes in 1852, and the Yorkshire show at Sheffield in the same year, being a descendant of Medora's. The herd of Mr.

Housman, of Lune Bank, can also boast of female descendants of Medora worthy of their illustrious lineage. From this ancestress descends, with two intermediate crosses, the valuable cow Gulgare, by Grand Turk, the property of Mr. Housman, with the well-known family to which she has given birth. Mr. Langston's prize bull Lord of the Harem is from Gulgare herself. Blossom was bought by the Earl of Londsale at the Studley sale in 1834, and, after breeding four calves, was slaughtered in 1840. Own Sister to Isabella also had Imogen, by Argus, which was sold at the Studley sale to the Earl of Carlisle, and became the dam of Isabel, by Belshazzar (1704); and Isabel, through Lord Marlbro', and the Yeoman, both bulls of Lord Carlisle's, also containing the blood of Lady Sarah's Belshazzar (1704), was the grandam of Isabella Howard, the parent of another excellent family at Mr. Housman's. This Belshazzar, who was contemporary with Mr. Booth's Belshazzar of the old Red Rose tribe, was from the third sister of Isabella by Pilot Lady Sarah. The latter became the property of the Earl of Carlisle, and produced at Castle Howard three bulls and four heifers, one of which was the dam of Lord Stanley, which was purchased by Messrs. Booth and Maynard.

Isabella by Pilot, now the best known to fame of the three sisters, produced, at Studley, Isaac by Young Albion, Albert by the same bull, Isabella, sold to Mr. Bolden, Young Isabella to Mr. Paley, and Belinda to the Earl of Carlisle, and four others, and on the sale of the Studley herd she alone was retained, and transferred to Warlaby, where she gave birth, in her eighteenth year, to Isabella Matchem, afterwards the dam, as will be seen, of a numerous progeny. The fate of Isabella's son Isaac is always looked back to by his breeder with regret. The demand for bulls was then only commencing. Isaac had been let for a year to Miss Strickland, of Apperley Court, and on his return, Mr. Booth not requiring him, he was fed off to make room for younger ones, before his eminent merits as a sire had been discovered. The Isabellas had all great capacity for rapidly acquiring ripe condition on pasture. As an illustration of the fallaciousness of the usual mode of judging cattle by the softness of their flesh, it may be worthy of mention that when the Royal Agricultural Meeting was first held at Northallerton, a grass-fed heifer, by Ambo, of Mr. Booth's, a daughter of Isabella, was shown and thrown out as being too hard-fleshed. Not breeding, she was slaughtered at York for Christmas beef. Her two successful rivals also failed to breed, and were also slaughtered, and the palm for the best carcass of beef was awarded to Mr. Booth's heifer over her Northallerton rivals. Nor is this case without many a parallel in the history of Royal Shows. Numerous as have been the prizes which the Booth cattle have received, their number would have been greatly increased if judges had always carefully distinguished between flesh and fat. When their decisions have been on this ground—as they often have been—adverse to the Booth cattle, many an experienced butcher has proclaimed a very different opinion; and could the appeal *ad crumenam* have been adopted by an immediate sale of the rival animals to the shambles, how useless would it have been in most instances to contest the supremacy of the Booths?

Another cow which Mr. Booth took with him to Studley was Madame, by Marshal Beresford, also of the Fairholme Blossom tribe. From her came Fancy and Fair Maid, both by Agamemnon. The former was the dam of Fatima, a very neat, middle-sized cow, which, put to Mr. Maynard's Sir Alexander, produced the famous bull Young Sir Alexander. This bull was the sire of Strawberry, whose daughter White Strawberry by Rockingham held perhaps equal rank in Mr. Booth's estimation with Anna, Isabella, and her own contemporary

rivals, Necklace and Bracelet. Fair Maid, the other daughter of Madame by Marshal Beresford, was the dam of Miss Foote, whose descendants were very numerous, and were all disposed of at, and previously, to the Studley sale. They united in a remarkable degree the two properties of good milking and rapid fattening. Fair Maid herself was sold to Mr. Ellison, of Sizergh, where she bred many calves, and proved herself an excellent dairy cow. Miss Foote was sold to Captain Shawe, and Fair Helen, her daughter, who was the dam of the noted bull Cossack, to Sir Charles Tempest, with whom she bred four heifers. We remember, in 1853, a stray waif of this famous tribe in the hands of an innkeeper at Clapham, in Yorkshire. It was, in fact, the broad level back and symmetrical proportions of this cow that induced us to purchase our first Shorthorn, her bull calf. The cow was a granddaughter of Miss Foote, being a daughter of Lady Helen, then the property of Mr. Foster, of Clapham. She was sacrificed whilst still in her prime, her owner being tempted by the offer of a high price for her from a butcher.

Some mention of the bulls bred and used by Mr. Booth during his residence at Studley seems here to be required.

One of the first bulls of superior mark bred by Mr. Richard Booth after his removal to Studley was Julius Cæsar, a bull of very symmetrical proportions, which he had the merit of impressing in a surprising degree upon his offspring. No matter how dissimilar and opposite in form and breed the cows to which he was put might be, the produce all bore the unmistakable stamp of their sire. The offspring by him, of the shabbiest lane-side cow, had, it is said, all the character of a pure-bred Shorthorn. It may be worth while to inquire how far the remarkable property which distinguished this bull may be traced to the preponderating influence of any particular progenitor or progenitors in his pedigree. We find that the first, second, and third cows in his pedigree were by one and the same bull, Twin Brother to Ben. The sire of the 4th was by a son of Favourite, whose dam was by Son of Twin Brother to Ben, and his grandam and g.g.d. both by Twin Brother to Ben. The sire of the 5th was by a son of Favourite, whose dam and grandam were both by sons of Favourite. The sire of the 6th cow (the dam of Julius Cæsar) was by a grandson of Favourite, the blood of whose dam, g.r.d. and g.g.d. was a pure concentration of that of Favourite and Twin Brother to Ben, to the exclusion of any other. In the pedigree of Julius Cæsar, in Coates's Herd Book, the first double cross of Twin Brother to Ben is not mentioned; but under Florette's, a daughter of Old Red Rose, it is so. Several of the first entries in the Herd Book do not, in all cases, give the full pedigree.

An examination of this pedigree lends weight to the opinion of many experienced breeders, that, in general, the capability of a bull to transmit to his offspring his own peculiar mould and properties depends upon his having inherited them from a succession of ancestors endowed with similar characteristics. It is doubtless to the concentration of hereditary force thus derived that the extraordinary transmissive power of such bulls as Comet, Favourite, and Julius Cæsar is to be attributed. At the same time it is a curious circumstance, and one that should not be forgotten—as often modifying to some extent the principle above enunciated—that amongst animals similarly bred there are some bulls, and some cows too, that possess an immeasurably greater transmissive influence than is allowed to others.

Pilot, another of the bulls of this period, was bred by Mr. R. Colling, and purchased by Mr. T. Booth at the Barmpton sale in 1818 for 270 gs. He was used in all the three herds, and there was no bull to which they were

more largely indebted. The close in-and-in breeding of this animal has already been shown. He was let to Mr. Rennie for a short time; but his stock at home proved so good, that he was recalled at the expiration of his first season. Pilot was a small compact bull, somewhat undersized, but he had great thriving propensity, and was a capital sire, and may be appropriately cited as a striking example of the preceding remarks. I am indebted for this account of Pilot to one who remembers him well—that old friend of the Booths, the much-respected Nestor of the Shorthorns, Mr. Wetherell, who, like his friend Mr. Charge, is still hale and strong, a living record of early Shorthorn times, from whom younger men learn the lessons of the past. Pilot eventually went to Norway as salted beef. Isaac, another bull of note, bred by Mr. Richard Booth, has already been referred to. Burley and Ambo Dexter, containing a large amount of the Favourite blood, were partially used in the herd during the last three years before the sale.

In the year 1834 Mr. Richard Booth, finding that some of his best pastures were required by their owner for other purposes, gave up the farm at Studley, and selling off the whole of his herd, with the exception of Isabella by Pilot, retired to Sharrow, near Ripon. After residing there for a year, which, from being bereft of his favourites, he describes as the least happy period of his life, Mr. R. Booth, in consequence of his father's death, succeeded to the estate and Shorthorn herd of Warlaby. The sale of the Studley herd was a step which Mr. Booth has always regretted, as many of the animals it contained were, in his opinion, every whit as good as any he has since bred. They were dispersed into many hands, and though Old Cuddy's assertion, that they have "a swealed away" is certainly too sweeping, it may be doubted whether, even in the hands of very celebrated breeders, like Mr. Fawkes and others, the descendants of these famous cattle have ever quite equalled their cousins at Warlaby.

It is now necessary to return back a quarter of a century to resume the history of the Killerby Herd.

THE KILLERBY HERD.

We have seen that in the year 1814 Mr. Richard Booth took with him to Studley some of the animals then forming the Killerby herd. Mr. Thomas Booth shortly afterwards supplied the place of these with other cows, which became the foundresses of three famous tribes—the Farewell tribe, from which sprang Faith, Hope, and Charity; the Broughton tribe, from which came Bliss, Blithe, and Bonnet; and the Dairy Maid or Moss Rose tribe, from which are descended Vivandière, Camp Follower, and Soldier's Bride. The first of the Farewell tribe came from Darlington; the first of the Broughton tribe from a dairy farmer in a village of that name, who had some good cattle, but, as pedigrees were slightly valued in those days by the tenant-farmer class, nothing further is known about them. The first of the Dairymaid tribe came from an equally good stock in the village of Scorton.

In the year 1810, on the occasion of Mr. J. Booth's marriage, Mr. T. Booth removed to Warlaby, giving up to his son, Mr. J. Booth, the Killerby estate and a part of the shorthorn herd, and taking the remainder with him. A portion of the Fairholme or Blossom tribe, and of the Old Red Rose tribe, were removed to Warlaby, the remainder being left with Mr. John Booth. The Hahnaby tribe was also divided, but the famous Bracelet tribe was all left at Killerby. From this period down to the year 1835, when Mr. R. Booth succeeded to his father's herd at Warlaby, there is comparatively little known of the two

herds. The times were unpropitious for the shorthorn. The spirit of improvement which the example of the Collings had evoked only partially survived. There was a general depression in all agricultural produce, and consequently but little demand for animals, the purchase of which appeared at that time to partake so much of the nature of a speculation. Not yet did

"Generous Britons venerate the plough,"

or regard with respect bucolic occupations. A man gained more *colat* by a display of science and judgment in going across country than in the breeding of cattle. In some districts, a gentleman almost lost caste by devoting himself to such ignoble pursuits, and was sarcastically dubbed by his companions in the pink "cow-scratcher."

But though "fallen on evil days," the stock at Killerby was of high character, and was frequently resorted to by the few good breeders of that period for the purchase of animals. It is a house where all comers were, and still are, regaled with the welcome of the olden times. Killerby is one of the pleasantest of the pleasant homes of England. It is a substantial square manor house, picturesquely situated on a gentle eminence to the south of the river Swale, and two miles from Catterick, the site of the once important Roman camp and city of Cataractonium. The house occupies the site of the ancient castle of Killerby, once a stronghold of great magnitude, founded in the reign of Edward the First by Sir Brian Fitzalan, Earl of Arundel. It is approached by a road winding through verdant pastures thrown together into the form of a park, adorned here and there with noble elm and walnut trees. The estate consists of about 500 acres of arable and pasture land. The soil, which is very mixed—gravel, strong clay, marl, and peat being sometimes found in the same field—is more adapted for sheep than heavy cattle, though there are two or three excellent pastures. Several of the light tough grass fields have been ploughed up of late, and heavy crops of oats and turnips grown in their place, which has allowed the number of sheep kept to be greatly increased. Although half-bred sheep are occasionally seen on the farm for summer grazing, the staple stock are pure Leicesters, for the wool of which Messrs. T. C. and J. B. Booth, the present occupiers, have gained several prizes at the Yorkshire shows.

In treating of the Warlaby herd, I shall have occasion to speak of the close and almost patriarchal alliance that has so long subsisted between master and servants on these estates, of which the latter appear to be part and parcel, so linked to the place and race and to the family interests that they partake more of the nature of clansmen than servants. But one little illustration of this it is my bounden duty, as faithful historian, not to omit here, the subject of it being quite a genius in her way. In one of the picturesque little grey-thatched cottages at Killerby still lives Mrs. Leyfield, the widow of an old and faithful retainer of the family, once well known in the show-field as the attendant on Bracelet, Mantalini, Birthday, &c. Mrs. Leyfield has—in the dialect of the country—"foughten up" a large family, and taught them how to handle fork, gripe, hoe and axe, drive a team, and lade a corn cart, all of which she can do manfully herself. When mowers were at a premium, she was only deterred from wielding the scythe by the necessity it would have entailed of an expensive though *inexpensibile* addition to her wardrobe. She is Lady Paramount of the field-women, nor is her sway confined to field and fold; her young masters and mistresses own it too, and stand in wholesome awe of her goodyship, seldom venturing to contest the authority of this rough-hewn but kindly-hearted cottage dame. She now rears the beautiful game-fowls for "Maister John, whae gets all t'credit 'f it wanna for me, he wadna hae ane gam-bird, 'ld!"

The late Mr. Booth, of Killerby, was known and beloved throughout the county as a strikingly genial example of the worthy and hospitable northern agriculturist, ever devoting himself to the service of his friends (and he had many) and to the advancement of agricultural improvement. The humblest, equally with the most important, agricultural societies might always rely on his good offices, whether as patron or judge, in which latter capacity being confessedly unrivalled, he was in great request, and would most good-naturedly consent to officiate, though his doing so involved the exclusion of his own cattle from competition. As might have been expected, from his fine and manly character, he was also a keen sportsman; like Chaucer's squire,

"Well could he sitte a horse and faire y-ride;"

and Yorkshire, that modern Thessaly of horsemen, knew no more thorough judge of hack or hunter. His skill in this respect still survives in his sons; many a field and many a showyard testify that in this regard, as in others, Killerby has not degenerated from its ancient fame. He had, too, a natural taste for the fine arts, and when from illness he could not go far from home, he had his horses led out, and would sit on the lawn, or in the Hall, to paint them. Here, too, his taste survives, and if we touch lightly on the subject it is because more delicate fingers now hold the brush, and we would not trespass unbidden upon the elegant recreations of Killerby's fair Mistresses.

When, on the establishment of the national shows in 1839, the superiority of the Killerby Shorthorns had been proved in contest with the best animals of the day, the herd attracted many visitors, and its inspection was as free to all classes as were the fruits of its owner's experience in breeding, which he was ever ready to communicate to the neophyte. It may not be uninteresting to the present fair enthusiasts in Shorthorn matters to learn that, in the absence of her husband, the late Mrs. Booth—a lady who will long be remembered in that neighbourhood for her benevolent disposition and engaging manners—would herself most affably do the honours of the herd, leading the way to her especial favourites, and expatiating on their pedigrees, points, and perfections, sometimes with a dash of arch humour, and always with the grace and delicacy of the thorough-bred lady that she was. Mrs. Booth's sister, Miss Wright, had an equally keen appreciation of the merits of a good Shorthorn, and would stop any one of kindred tastes, who happened to be passing through Cleasby, to have a chat on her favourite topic, or to lead them to the Garth (since known by his name), where in the fulness of his days and honours repose the remains of Comet.

For some years after the dispersion of the Staley Shorthorns, in 1834, (until perhaps 1845-6, when Mr. E. Booth's Faith and Hope were in the ascendant), the Killerby herd, with the halo of its Bracelet and Mantalini triumphs, held a more conspicuous place in public view than that of Warlaby, and it is fitting, therefore, that we should first turn our attention to the history of its tribes, though the two herds, owing to their common origin and the constant interchange of sires, are so intimately allied as to make it difficult to dissociate one from the other: thus, for example, Pilot was joint property and used in both herds; Mr. R. Booth's Argus and Priam were respectively the sires of Toy and her daughters Necklace and Bracelet in the Killerby herd, while Bracelet's son Backingham became the sire of Charity and a host of prize winners in that of Warlaby. Again: Mr. R. Booth's Leonard, Vanguard, and Hopewell were freely used in both herds.

Amongst the cows composing the Killerby herd in the year 1835 were Toy by Argus, her daughter Little Toy by Volunteer, and Ivory by Matchem, all of the Bracelet

tribe, and three other Matchem cows, viz., Maiden of the Mantalini tribe, Landlady of the Lady Betty tribe, and Flora the the grandam of Colonel Towneley's Beauty.

Toy was a very neat, thick-framed cow, with a magnificent udder. Her milking abilities were the boast of the Killerby dairymaids, and were transmitted to her famous twins Necklace and Bracelet. The latter were bred from very close affinities; thus Vestal the dam of Toy was by Pilot; Toy was by Argus, a son of Young Albion and grandson of Pilot, and out of Anna by Pilot; her daughters Necklace and Bracelet were by Priam, who was by a son of Young Albion from Isabella by Pilot. Toy had twice previously been put to Young Matchem, but the offspring, Teetotum and Plaything, were not at all equal to the twins. Teetotum, however, was the parent of Ladythorn by Lord Stanley, whose portrait in the "Herd Book"—evidently a portrait—unmistakably proclaims her a good cow; and in truth she was second only to Birthday in merit. She was sold to Mr. Banks Stanhope for 150 guineas, a great price in that day, and in 1845 won the first prize at the Royal at Shrewsbury in the cow class; her two daughters, Lady Bird and Reveasy Thorn subsequently earning fame in the show fields. From Toy was also descended the cow Gertrude, purchased, together with her lovely daughter Lady Hopetown, at Mr. Bolden's sale, by Mr. Torr, who had previously bought, at the Killerby sale, Sylphide, also sprung from Toy. Perhaps the most valuable family of Toy's descendants, next to Colonel Towneley's—which are derived through Bracelet—are the progeny of Sylphide in Mr. Torr's hands. They rejoice in the names of Young Bracelet, Bracelet Second, and Third, &c. From Toy's daughter Little Toy are descended Mr. Waldo's cow Spicey and her daughter, Mr. Chandos Pole Gell's Almaack's Belle, both lately the property of Lady Pigot. But we must here return to the twin-born progeny of Toy, the all conquering Necklace and Bracelet.

It does not appear that Mr. John Booth was a very frequent competitor in the show-field until the establishment of the Royal and Yorkshire Shows in 1839. Before this time Shorthorn cattle were kept chiefly for dairy and grazing purposes; the majority of the male stock were steered, and many a fine heifer that took the butcher's eye was converted into Christmas beef. Necklace and Bracelet shared the pasture and the straw-yard with the ordinary stock of the farm until nearly two years old. As calves they never had more milk than their dam, who suckled them both, supplied; and, throughout the whole of their victorious career, they derived their chief support from the pasture, with a daily *bonne bouche* of corn and cake. Yet Bracelet won seventeen prizes at the various meetings of the Royal Agricultural Society of England, the Highland Society of Scotland, the Yorkshire Society, and other local shows; and at the Yorkshire Show in 1841, where she won the first prize for extra stock, the sweepstakes for the best lot of cattle not less than four in number, was awarded to Bracelet, Necklace, Mantalini, and Ladythorn. Necklace won sixteen prizes and one gold and three silver medals at the various meetings above mentioned, as well as at the Smithfield Club, where she finished her career as a prizetaker in 1846 by winning the first prize of her class and the gold medal (for which there were thirty-seven competitors) as the best animal exhibited in any of the cow or heifer classes. At the Smithfield Show, in the following year, the same prizes were awarded to Mr. Wiley, and in 1849 to Mr. Cartwright, for animals bred from the Killerby stock. In five years four first prizes for the best Shorthorn cows at the Royal Agricultural Society's meetings were awarded to animals bred by Mr. Booth, of Killerby; in 1841, at Liverpool, to Bracelet; in 1842, at Bristol, to Necklace; in 1844, at Southampton, to Birthday; and in 1845, at Shrewsbury, to Ladythorn.

To this day it is a moot question, amongst those who remember the world-renowned twins, to which of them could be most justly awarded the palm of beauty. Necklace is said to have had neater fore-quarters, and to have been rather better filled up behind the shoulders. Bracelet had fuller, longer, and more level hind-quarters. Bracelet was the dam of the famous bull Buckingham, by Musculman, and of Morning Star, by Raspberry, which was sold in 1844 to Louis Philippe. She also produced Birthday by Lord Stanley, whose career as a prize cow at the Royal, the Yorkshire, and the County of Durham Shows, was eminently successful. She was the dam of Hamlet, by Leonard; and whilst in calf with him she had her stifle joint put out, through being jumped upon by another cow, and, being incapacitated for further breeding, was slaughtered. Birthday was born in the field opposite the house on the 20th of May, which happened to be Mrs. Booth's birthday. The herdsman seeing that Bracelet had calved, hastened to bring home the new arrival. The party sitting at dinner observed him, and turned out to welcome the daughter of Lord Stanley, then approaching in a wheelbarrow, from which (and it was accepted as an augury of her future achievements, and an indication that such vehicle was all unworthy of its freight) she jumped indignantly out, and staggering on to all fours, assumed a show-yard attitude. She was then and there unanimously cyleped "Birthday" in honour of the occasion, and on many happy returns of that day Birthday's health was drunk together with that of the amiable mistress of the mansion; and as her yearly recurring triumphs in the show-field were recounted, the episode of the wheelbarrow was not forgotten. Birthday, like her dam, was unfortunately injured in her stifle joint, and, after suffering for some time, and consequently wasting considerably, was slaughtered, when the flesh over her back and loin was found to be 5½ inches deep, and her total weight of beef 87 stones, of 14 lbs. to the stone. Birthday bred Gem, Genuine, Birthright, Lord George, and Brigadier. The two first were supremely beautiful. Gem is described by Mr. Booth as having been much like Queen of the Ocean, and possessing very sweet fore-quarters. It is said that Sir Charles Knightley—and England can boast no higher authority, nor one more studious of fair proportion—considered her the *ne plus ultra* of Shorthorn excellence. Gem died from flooding after her first calving. In a volume of the "Herd Book" at Killerby is a slip of newspaper with the following paragraph: "At the Yorkshire Agricultural Show held this week at Wakefield, six pure bred Shorthorns were exhibited for competition by Mr. Booth, of Killerby, and each gained a first prize in the different classes in which they competed. We question much if such another exhibition could be produced by any other breeder of Shorthorns in the Kingdom." This was in 1846. The following are the animals referred to: First prize yearling bull, Hamlet; first prize cow, Mantalini; second ditto, Alba; first prize three-year-old cow, Gem; first prize calf, Bloom; first prize in extra stock, Birthday. The newspaper version, it will be seen, is not quite accurate, for Bloom was exhibited by Mr. Richard Booth.

Another daughter of Bracelet was Pearl, by Leonard, whose grand-daughter Pearly was purchased at the Killerby sale by Col. Towneley. Pearly was by Royal Buck, who was by Buckingham, a son of Bracelet; her dam was Manille by Brigadier, who was by Morning Star, a son of Bracelet, and out of Birthday, a daughter of Bracelet; and her grandam was Pearl, a daughter of Bracelet. The close in-breeding of Bracelet herself has already been shown. Pearly was the parent of Ringlet, sold for 500 guineas to Mr. Douglas, who now shares with Col. Towneley the only surviving lineal descendants in the female line from Bracelet herself. Pearly subsequently

produced Pride, Frederick's Bracelet, Pearl and Precious Stone, against whom a heavy sentence has gone forth. Thursday, the 17th inst., will see them and their progeny hurled from that Olympus of Shorthorns, Towneley Park, into the nether regions of bovine life. However, "the world is all before them," and they will certainly reward hospitable entertainment. The breeding of these animals, and others of almost equally fashionable descent, fully justifies Mr. Stafford's remark, that "this sale offers an opportunity rarely to be met with of obtaining animals of the highest repute," second to none in the kingdom except to that of Warlabby. The signal triumphs which the members of this herd have achieved in the national and other show-yards, and the enormous prices at which some of them have been sold, are the best testimony to the consummate skill which Mr. Eastwood showed in their selection, and to the watchful care and tutelage with which they have since been tended by Mr. Culshaw; and the approaching dispersion of it is, perhaps, the most important event in the Shorthorn world since the late Lord Ducie's sale.

Bracelet's twin-sister, Necklace, has unfortunately now no female representatives. She bred Diamond by Rubens, Stanley by Lord Stanley, sold to M. St. Marie, and Jewel, the dam of Jeweller. This bull was used in the Towneley herd, and was the sire of the famous cow Butterfly, and many other prize animals. Jeweller was by Hamlet, who was Bracelet's son by Leonard; his dam was Jewel by Leonard; his grandam was Necklace, Bracelet's twin-sister; so that it is most apparent, even if this had been all, how much the Towneley herd is indebted to the Booth element which it contains, for its great success. But this is not all; for—not to mention others—Valiant (12253), Master Butterfly the 4th (14920), and Butterfly's Nephew (15714), which have all been used in the herd, are all of Booth families, the first of them being also principally of Booth blood, and the others containing a large amount of it, while at the present time a fair proportion of the young bulls and heifers owe their origin to Baron Hopewell, a pure Booth bull, of the Mantalini family, bred by Mr. Barnes. Jeweller was a small, rather shabby-looking bull, but with great grazing propensity. After the expiration of his first season at Towneley he was returned to Killerby, and Mr. Booth fed him off. Just after his sale and delivery to the butcher, Mr. Eastwood drove over to Killerby, and, walking round the yards, inquired for his shabby friend. "He has gone to the butcher," was the reply. "When? I have come to buy him," exclaimed Mr. Eastwood. "How could you think of sacrificing such a bull?" An express was sent off to arrest the axe, but unfortunately it was too late. It may be here observed that Mr. Eastwood at that time superintended the management of the Towneley herd, as well as of the estates, having first, by the sale to Col. Towneley of his own well-selected herd, and then by the excellent and judicious purchases which he made, laid well and skilfully that foundation on which Mr. Culshaw has since erected so grand a superstructure.

The Gaudy, alias Lady Betty tribe, originated in a cow bought of Mr. Marmaduke Taylor, of Catterick; whose daughter's *sobriquet*, "Lady Betty," was bestowed upon the new purchase. Mr. Booth describes her as a very fine cow, "short in her hair, but as round as a fork shaft, without a hill or a hole in her." She was the dam of a cow very famous in her day, Old Gaudy by Suwarrow; fifth in descent from whom came Madeline, the dam of Col. Towneley's bull Hudibras, and his superb cow Alice. The latter had perhaps few, if any, equals in her day. Her back was of astonishing width and levelness, her loin and chine being remarkably wide, and her ribs boldly sprung. Her forequarters and whole frame were very symmetrical, with the exception that her tail was set on rather high,

and her "tuts" somewhat deformed with fat. She won the *Irish Farmer's Gazette* cup, value £120, in 1853, and the first prize and gold medal at Smithfield in 1854.

Towneley could formerly boast of the representatives of another family of the Killerby Shorthorns descended from the cow Floranthe, previously mentioned, as one of Mr. J. Booth's breeding stock in 1835. They were descended from Mr. Charge's cow Exhalation, by Hulton. Floranthe's daughter Mantle, by Marcus, was sold by Mr. Booth to Mr. Bannerman, and by him to Col. Towneley. Mantle was the dam of Valiant, and the splendid prize cow Beauty, both by Victor, of the Bracelet tribe. Beauty was a fine, round-barrelled cow, of a rich roan colour. She had rather large, but well-cushioned hips, exceedingly good breast, and very heavy top, but rather light thighs and flank. She won the first prize of £20 at the Royal Society's Show at Lincoln in 1854. She was the dam of Beauty's Butterfly and Beauty 3rd, whose son, Master Butterfly 4th, was sold to the Emperor of the French. Beauty's Butterfly was one of the most beautiful of Shorthorn cows; her lovely head, with its open curly brows and delicately chiselled muzzle, its waxy crescent horns and full lustrous eye; her gracefully swelling neck, well-sloped shoulders and broad full breast; her astonishing girth and rotundity of frame, and the even development of her muscle over every part of it, composed a *coup d'œil* not easily forgotten. Her transcendent beauty, when she was shown in Baker-street, roused for a moment even Cockneys from the phlegmatic apathy with which they usually regard all pastoral subjects: she was the talk of "the town;" and Punch immortalized her in the elegant lines he put into "Joe Culshaw's" mouth. To a critical eye, however, Beauty's Butterfly was not exempt from failings: her hindquarters rather wanted length, and her thighs and twist fulness, to be in strict harmony with her otherwise perfect proportions. Entomologists speak of the "Twenty-plume Butterfly," a prefix which, we think, such an adept in nomenclature as Mr. Culshaw might appropriately have bestowed on this Hour of the herd, in token of some score of victories achieved by her. The term "Butterfly," it is true, has been objected to altogether by some, as conveying the idea of an airy, volatile, sportive ephemera rather than of a long-faced, ponderous, bellowing beast of the field; but we have the "Long-horn Moth," why not the Short-horn Butterfly? For our own part, we never penetrated into that Shorthorn Elysium, Towneley Park Farm, and witnessed the comfortable quarters and comfortable case of its inmates, without echoing the aspiration of the old song—

"I'd be a Butterfly, born in a *Byre*!"

The Killerby herd will be continued next month.

I am, sir, your obedient servant,
W. CARE.

GUANO.—The imports of guano appear to have been relatively very considerable last year. Thus they amounted to 233,574 tons, against 141,636 tons in 1862, 173,423 tons in 1861, 141,435 tons in 1860, 84,122 tons in 1859, 353,541 tons in 1858, 288,362 tons in 1857, 191,501 tons in 1856, 305,061 tons in 1855, 235,111 tons in 1854, 123,166 tons in 1853, 129,889 tons in 1852, 243,014 tons in 1851, 116,925 tons in 1850, 83,498 tons in 1849, 71,414 tons in 1848, 82,392 tons in 1847, 89,203 tons in 1846, 283,300 tons in 1845, and 104,251 tons in 1844. These figures show remarkable fluctuations; but, on the whole, the import of guano into Great Britain seems to be increasing.

ON AN EQUITABLE TENANT-RIGHT.

One of the most important questions connected with the improvements introduced by our modern agriculture is that of an equitable tenant-right. This is a subject which, of late, has not been prominently brought forward or sufficiently discussed by the agricultural public. It is high time that some enlightened and definite course should be adopted as the foundation upon which a modern structure of tenant-right may be built in accordance with the spirit of the times in which we live, and as an encouragement and security to every tenant desirous to invest his capital in liberal management, *i. e.*, high and artificial manurings, deep cultivation, and effective drainage, as also in improving the farmeries.

The Farmeries.—Upon the majority of entailed estates, it is with great difficulty that the landlord can be induced to expend much capital in the erection of improved farm buildings. Modern agriculture has decreed that extensive farm premises, if not (as many affirm they should be) covered homesteads, are truly necessary to promote the satisfactory progress of the foldyard stock. Now, we have so many inventions for the cheap erection and covering of temporary sheds and hovels, that no valid objection can be made to the tenant (under an equitable tenant-right, in which these buildings shall be included) erecting them out of his own capital, provided he is allowed the value of them, whatever it may be, upon quitting the farm. It is true that temporary erections made at the commencement of a twenty-one years' lease may not be of much value at the close of it; but be that as it may, the tenant should be entitled to it, however small in amount. The landlord, or his agent, ought to have a voice in deciding as to the extent of these temporary erections, or a sanguine tenant might wrong his landlord.

Drainage and Subsoiling.—Of old, the tenant has a right to the unexhausted value of labour and material laid out in subsoil drainage, according to circumstances, unless it is done under special agreement with the landlord. Of the value of subsoiling, which is the very best mode of making subsoil drains work effectively, he has no allowance. Subsoiling to any considerable depth is very expensive work, and the land subsoiled is, no doubt, permanently benefited. The tenant, therefore, under an equitable tenant-right (I don't mean customary tenant-right, that I want greatly to modify or abolish), is fully entitled to its value, and which the good judgment of a competent valuer would readily estimate. The improved texture of the soil itself would determine it.

Deep Cultivation.—This is an improved modern practice to a great extent. It was not practised effectually until the introduction of new implements which were well adapted to perform the work. Modern implements will effectively cultivate to a depth heretofore unattainable. The strong, heavy-land iron ploughs will turn up the soil to twenty inches in depth. Cotgreave's plough, and other similar applications of power, will reach the depth of twenty to twenty-four inches. But the climax has been achieved by steam power. This power, with proper implements of culture, does it in every respect much deeper, and far better, than any horse-power can possibly do; in fact, it has almost revolutionised the process of clay and heavy-land farming. Well, so far as I know, there is no allowance made to an outgoing tenant for the improved value of the soil thus benefited by this deep cultivation other than if done by a common plough. Can this be an equitable tenant-right? Customary tenant-right allows

for the value of ordinary ploughing. Light land has its value; heavy land the same in proportion; but such surprising and substantial work as can be accomplished by steam cultivation has yet to find its value. This, then, is one of the most important parts of the question of an equitable tenant-right, and valuers ought at once to make a stand upon it, and give a fair compensation for work so effectively done, by which the subsoil is so greatly benefited, to the manifest advantage of the in-coming tenant.

High and Artificial Manurings.—This is another important part of the great question of a modern equitable tenant-right. The introduction of artificial manures to promote the growth of farm crops is quite of recent origin. Crushed bones took the lead, and that about forty years ago. Now, we have, in addition, Peruvian and other guanos, superphosphates, urate, nitrate of soda, gypsum, rape-cake, blood manure, soot, nightsoil, saltpetre, and many other varieties, or so-called varieties. Now, the application of these efficient aids in multiplying and increasing our farm crops is quite a new era in British farming, but the tenant-right value of such applications for the most part has yet to be defined. For instance, a tenant cultivates admirably, and applies 4 cwt. of Peruvian guano per acre in aid of his potato crop. It is contended that he is not entitled to any allowance for the value of guano because he leaves no straw for the use of the in-coming tenant. It is at the same time admitted (and which is a fact) that no land can be in a better condition to produce a crop of wheat. Is not the out-going tenant entitled to some value of such an extra and unexhausted manuring as 4 cwt. of Peruvian guano per acre? It cannot be exhausted in producing the first crop, therefore something is due to him, although minus the straw; besides, it is pretty nearly clear that the management, the manuring, and subsequent culture far exceeds in value a crop of straw, and yet no allowance is to be made! What avails these important discoveries in artificial manurings, and the annual subsoiling between rows, if the value of straw is to supersede all? Some landlords don't object to the removal of straw, provided copious dressings of artificial manures are substituted. It is becoming quite a custom to make this substitution for manuring off-lying lands, and thus save a large amount of cartage. It is very probable that in all stereotyped rotations of crops and farming no great change is needed. There is, however, much scope for a valuer's judgment. It is unquestionable that much extra management, and much larger quantities of corn, cake, and other cattle foods are now consumed upon these farms, and that very liberal dressings of artificial and rich fold-yard manures are applied, all of which ought to be taken into consideration by every valuer, and a fair (I had almost said a liberal) allowance should be made to the out-going tenant for any unexhausted application of management or manures, and for the spirit and energy employed in the conduct of his farm.

The whole subject requires ventilation and discussion. There is this great and encouraging fact: British farming has undergone a wonderful advancement during the last half-century. The cultivation, drainage, and general management of land is surprisingly improved. The discovery, the enlightened and free introduction of the many varieties of chemical manures now applied to the soil, is of itself a wonderful achievement in agriculture. The numerous and beneficial changes made in the growth and management of our farm crops is also another important

feature in modern practice. Taking these and many other collateral improvements and advantages which are now enjoyed by our present race of farmers, it is obvious that the old customary mode of going through a valuation between an out-going and in-coming tenant is manifestly absurd and unjust. It is high time, therefore, as I have said above, that some definite course should be adopted. It is right for the out-going tenant: it is right for the in-coming tenant: it is right for the landlord. It would

establish confidence and give security to every enterprising and judicious farmer. The knowledge that he would be reasonably compensated for every proper application of his skill and capital in management, manurings, drainage, and all real improvements, would continually spur him on to further efforts, so that the landlord, the in-coming tenant, and himself are all alike truly benefitted. We make these desultory remarks hoping to draw more general attention to the subject.

REGISTER YOUR LAND.

BY HOWARD REED.

It is not yet generally understood that means have been devised for the simple, safe, and cheap transfer of land. Few people, beside those who are in the habit of watching the course of legislation, are perhaps aware that a land registration office is now open, and has been at work for twelve months. Those who are waiting to learn the fact from their solicitors will decidedly be kept in ignorance a long time, especially if they are landowners—actual or prospective. These professional gentlemen seem to be perfectly oblivious to any change in the law intended to facilitate the conveyance of landed property. A friend of mine had thirteen acres to dispose of, a few months since. I advised him first to get a registration title to it. This could be obtained, I considered, at less cost than under ordinary circumstances, and would add considerably to the value of the land, since it would preclude the necessity of a repetition of the process at any future time. The land would, in fact, be increased in value, because it would be freed from an enormous charge on its changing hands. He mentioned to his solicitor his desire to have the land registered, who threw so many difficulties in the way, that he was deterred from adopting advice he now feels sorry to have neglected. When he became the owner of this little estate, the lawyers had charged him £40 for proving the title; and now all this outlay was to go for nothing. The solicitors and conveyancing counsel employed by the purchaser could not trust the work done by the legal advisers of the seller. The whole search must again be made into the validity of titles for many years back; and the consequence was that another heavy bill of like proportions had been received by the present owner, for payment. Nor is this all. Before my friend, whom I will denominate A, came into possession, a delay of some six months occurred, which proved less vexatious to A than it did to B, of whom he was to make the purchase. B was sadly in want of the money, and had to borrow on personal security, at a high rate of interest to carry on his business, while the legal ferrets employed by it were at work. To complete the case, C, the present owner, wants a loan upon this plot and some other land which he possesses; but before the bankers or the assurance office, to which he applies, will hand him the sum agreed upon, the validity of the title-deeds must be again tested by the officials employed by either of these parties, the expenses being borne by C.

The consequence is, the lawyers throughout have the best of the game, and will be the last people in the world to show any client of theirs the way to the door of the Land Registration Office. The new law brought in by the Lord Chancellor introduces a complete revolution in the law relating to landed property, and affects the profits of a powerful class of the legal profession. We accept it as one of the first fruits which have sprung from the Law Amendment Society. It is not to be valued because it diminishes the profits of a class merely; but because it

does away with a species of highly-paid work, which is quite as unproductive to the country as the work performed by felons at the wheel; because it liberates land, and lays the foundation for the improvement of the same, by making it as easy of transfer as "The Great Victoria" in Liverpool Dock-yard.

In Holland and Germany they are before us in this matter. An old writer touching on this question of land transfer says: "By these policies of the Dutch, and the want of our lands being put under a register, one hundred pounds a year in Holland at the present time will raise a family sooner, and drive a better and more profitable trade, than a man can do of a thousand pounds a year in England." There is a good deal of truth in this assertion; for on looking into the matter I find that a Dutchman, about the middle of the seventeenth century, deriving from the land in West Friesland an income of one hundred pounds, might proceed to the Bank of Amsterdam, and there tender a description of his lands and desire a loan of £4,000 upon them, with a tolerable certainty of getting it. This description would be filed, the next post would convey it to the registrar of the town nearest to his property, containing a register of estates to be registered there. The identification being correct in all particulars, the banker of Amsterdam, on receipt of the reply the following day, would tell out the money without further delay. The convenience of this mode of procedure, which enabled the Dutchman to trade with his land all the world over, will easily be seen to produce an advantage in his favour over that of the English gentleman with land worth £1,000 a-year. The trade of Holland flourished to an unprecedented degree upon this system, which at the period to which I refer increased the value of land to fifty years' purchase, while here it was considerably below twenty. Registered land is cash in trade. To see that it is so it is necessary only to suppose that the Dutchman meets a merchant upon 'Change at Amsterdam, and agrees with him for goods to the value of four thousand pounds for six months; he simply takes the merchant to the bank and gives him a ticket on his land, by the credit of which the vendor is fully satisfied, since the original loan made by the purchaser, of the banker, was within due limits of his power to borrow, it being (at that time) the practice in Holland to give credit upon land to its value within two years' purchase of its market price.

It is very satisfactory that we need not now refer to Holland or to Ireland for examples of a superior plan of conveyancing to our own. A man may now obtain a legal title from the Examiners at the Registration Court (provided his title be good), and may come forth with a sheet of parchment in his hand no bigger than the page of a newspaper, with a certified map attached to it. Suppose C who requires a loan upon his purchase were to do this, he could mortgage his plot to-morrow. No abstracts are

necessary, no title is to be made out, and no delay need ensue. The affair may be completed in a few hours, at an expense of a few shillings. I will give an instance which has already occurred at the office in question. "An estate of the value of £30,000 was registered and was then sold by the registered owner. The only title required was the production of the certificate of title; the conveyance was in a few lines, which was carried to the office and entered on the register in a few minutes. The new purchaser mortgaged the property, and the same simple process effectuated the change." How different this from what we have been accustomed to! Fancy the consultation and expenses which are here avoided. A cut so terribly short would naturally be considerable to a legal mind.

During the year it appears that there have been forty-two applications for registration, comprising property of the estimated value of one million sterling, much of it being building land, hitherto kept together from the legal expenses attending its transfer in parcels, but the subdivision of which will of itself increase the number of registered estates to several hundreds. Of these forty-two applications there have been some few which, not being within the provisions of the Act, have been necessarily unsuccessful. Of the others several have been already completely registered: the remainder are pursuing their road to what is termed a marketable title, through the technicalities which at present surround it.

Not a few were there, in high quarters, who predicted

the failure of this initial and most important step of the Law Amendment Society. It is a most gratifying circumstance that these predictions should have found no verification in fact. It was said that no title would bear the examination to which it would be submitted by the rules of the office. It is not here that the difficulty will be found, however; for, thanks to the care which has been exercised by the class of professional practitioners to which conveyancing has been entrusted, the great majority of title deeds in this country are found to be both legally and morally good. This is the only difficulty which could arise, and I am not aware that the title to land is submitted to stricter examination by the court than by the conveyancers. Then, supposing the cost of registration at the office to be the same as that which would be incurred outside, it is incurred once for all, and gives advantage to the man who wishes to trade with his land, which he could never obtain from the possession of land by simple conveyance. Landowners desirous to obtain a legal, transferable, and constant title—I may call it a *parliamentary* title, never more to be rendered uncertain by the technicalities of conflicting advisers—would do well to carry their deeds to the office themselves, and save the expense of an intervening solicitor, whose service will be of no value in the transaction.

Should this brief exposition of the facilities afforded by the Office of Land Registry induce any landowners to adopt this short cut to a title, my object in giving it will be completely answered.

CALENDAR OF AGRICULTURE.

The sowing of all grain crops must now be finished as fast as possible, and also lucerne and flaxseed. Finish the preparation of grass meadow grounds. Sow vetches for soiling, and grass seeds on wheat and barley tilths. The surface of wheat lands will be rough and stale: harrow it before sowing the grass seeds, and again after the seeds are sown; and roll with a heavy weight.

Get prepared as quickly as possible the green-crop fallows; and towards the end of the month plant beet-root in drills, well dunged, and 28 inches apart. Steep the seeds in weak solutions, and dry with hot lime. Plant potatoes in drills 30 inches apart, and well dunged with farm-yard manure in a half-putrescent state. Use strong sets of tubers, newly cut, very moist manure, and in a large quantity. Cover the drills quickly, and roll them down. Before the land is drilled, spread hot lime evenly on the surface, at the rate of 200 bushels per acre, and harrow the ground immediately; or strew the hot cinders evenly 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 common method; but it must be beneficial to the land, by reason of the moist exhalations that will be evolved during the dissolution of the hot cinders.

Early crops will now require horse and hand-hoeing, as carrots, lucerne, wheat, beans, and peas.

Paring and burning of lands will now proceed

vigorously. Burn the turves moderately into a black, torrifed mass, as in that state it will contain most carbonaceous matter. It is the best method yet known of bringing into cultivation all lands that contain much fibrous, inert, ligneous matters.

Burn for manure all rough earthy and vegetable substances from roadsides and ditch-banks; also mossy earths, and all combustible substances. The ashes will raise good crops of any kind.

Rye and water-meadows, winter barley, and vetches, will now come in to soil cattle in the yards, and for being consumed on the land by ewes and lambs. The food is best used by being cut and placed in racks, which are 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 may be much improved by the folding of sheep upon them.

The lambing season will now be mostly over. When beet-root and cabbages fail as food for the ewes, give oats and bruised oilcake mixed, and a portion of salt. Remove the stronger lambs to the pasture fields.

Attend to the milk cows and the suckling. Give the cows an ample supply of juicy food, natural or prepared; to the calves, as much milk as they can take. When begun to be weaned, at the end of sixteen weeks, give them, in racks in the calf-pens, young vetches, bruised cake, 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 oilcake 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 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 fallow lands for green crops, keeping most forward the portion to be sown with Swedish turnips next month. Plough clay lands for wheat fallow.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Asparagus will now be rising, and must be cut so as not to injure the crowns either by too rigid excision or by uselessly wounding the adjoining shoots. To remedy the mistake of getting an inch of insipid stuff at the top of a long stick of "packwax," and to obtain instead of it some real good grass of six inches, high in flavour, and tender in its whole length, a method has been previously described, and is again alluded to, of making a deep and rich bed. The ground, having settled, is divided by twelve or fifteen-inch-wide alleys into so many beds about thirty-six inches wide as the ground will admit. These are to be raised about four inches above the alleys by earth shovelled off the latter. The surface being then raked to a perfect fineness, two drills are drawn, an inch and a half or two inches deep, one foot from the edge on each side, and as much apart. The best asparagus-seed is to be sown, two or three inches apart, along the course of the drills, and immediately firmly covered with light earth. As the plants rise, they are now and then thinned out, to stand at first three inches apart, then six inches. Guano-water every week will promote growth and strength. Such seedlings, when thinned to one foot asunder and properly managed, will produce plants strong and durable as if two-year-old plants were purchased. Should that plan, however, be preferred, the fine earth ought to be raked off to the alleys, four inches level depth. The line being then stretched, the plants are to be placed by it, the root being opened, spread flat, and extending every way, over which, the crowns being retained upright in the centre, the earth is to be evenly spread, and pressed carefully down. A good watering from the rose finishes the operation.

Sea-kale beds, being prepared in much the same way, are to be sown with sound seed by the line, three seeds in a small circle of six inches diameter, two inches deep, and the circles two feet apart. The rows may be single, at four-foot distances, or if double, two feet asunder, to form a bed.

Sow lettuce, radish, corn and small salading twice or thrice. Sow peas (Prussian and Scimitar) and beans twice, in any most approved sorts. Sow borecole, including Scotch kale and Brussels sprouts, broccoli for winter and spring (the Early Grange's, White, Siberian Hardy, the Portsmouth

Sulphur, Miller's Late Dwarf, and the "Protected") Cabbage and savoy will supply succession, if sown early and late in the month. Sow spinach repeatedly; silver onions very thickly, for drawing young; onions, for bulbing; and leeks, if not already sown; carrots, parsnips, and red beet, all in the first days.

Celery: Sow Seymour's White and Hardy Red, in gently-warm leaf-beds, nasturtiums, and aromatic herbs.

Sow kidney beans of both kinds, if the soil be warm and dry; or in boxes under glass, to be transplanted when the true leaves become strong. In the latter case, sow early; in the former, not before the 15th.

Plant potatoes (Artichoke Suckers, if well rooted) in prepared beds, choosing showery weather.

Transplant lettuces (but expect them to run), cabbage, cauliflowers, and sea kale; and prick out, on beds of very rich soil, consisting chiefly of reduced manure, a number of celery plants, to become stocky.

Dress all beds with hoe and rake; earth-up and stick peas; and attend to neat order.

FRUIT DEPARTMENT.

If mildew threaten any wall-trees, dust the leaves with sulphur, and place mulch about and over the roots; and this again, at different stages of growth.

Strawberry beds, or rows newly planted, must have liberal supplies of water, if droughty weather set in.

FLOWER GARDEN.

Attend to annuals in pots, to thin out the seedlings. Plant herbaceous varieties. Dutch-hoe and neatly rake the quarters. Sweep and roll any lawn ground; and begin to mow in mild, showery weather. Plant or renew box edgings; and clean gravel walks, rolling after rains.

Any greenhouse plants require plenty of air, liberal waterings, and a shift of geraniums and all the free-rooting tribes. Heaths and hard-wooded plants require an airy, dry pit, facing the north or east.

Guano in fine powder, one ounce to the gallon of soft water, is a most useful stimulant to succulent plants of many kinds.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MARCH.

Although rather large quantities of rain fell in most parts of England during the early part of the month, both ploughing and sowing have made somewhat rapid progress. In the leading counties, the soil has worked remarkably well, and a continuance of the present seasonable weather would enable our farmers to finish their spring seeding quite as early as in the general run of years. Nearly the whole of our correspondents state that the winter wheats are looking remarkably well, that the plants exhibit great regularity, and that, consequently, the prospect for the new crop is favourable. The imports of wheat and flour from abroad have been only moderate; nevertheless, the demand for those articles has been in a most inactive state, and, in some instances, prices have ruled in favour of buyers. The enormous yield of the last crop, and the immense quantities of grain still in stack in most parts of England, have operated seriously against value. Millers have shown no disposition to increase their supplies, and many of the importing houses have been compelled to force sales on easier terms. Under the impression that prices have seen their lowest range, an extensive business has been passing in Black Sea and Azoff wheats for forward shipment—the transactions having exceeded 300,000 quarters—at prices ranging from 39s. 6d. to 41s. 6d. per quarter. In the event of the present season being unfavourable, these purchases would prove highly remunerative. And even a good crop in England would scarcely reduce the quotations much beneath their present level. All descriptions of barley have come freely to hand. Malt samples have continued steady, at full currencies; but grinding and distilling sorts have changed hands slowly, at slightly reduced rates. The malt trade, owing to the enormous "make," has been in a very inactive state, on lower terms. Oats, beans, and peas have given way about 1s. per quarter, and the sale for flour, both English and foreign, has been devoid of animation.

Most of our foreign letters state that the new wheats are turning out well, and that the transactions in them have been only moderate. Compared with the previous month, however, very little change has taken place in the quotations. The reports from America, in reference to the great deficiency in the maize crop in that country, are now fully confirmed. The effect upon value here, however, has been trifling; indeed, we may observe that the rates have been drooping, owing to the large offers to ship that description of produce from the south of Russia during the summer months. Wheat is by far too abundant and cheap to admit of any important advance in the value of Indian corn.

The wool trade has continued in a healthy state. The public sales held in the Metropolis have been brought to a close, and the prices realized have rather exceeded the previous series. Privately, a full average business has been transacted in most descriptions, and the quotations have been well supported. The accounts from Australia and the Cape inform us that heavy shipments had been made to England, and that the various auctions had been well attended by buyers. Our own clip is turning out well and of full average quality. The woollen trade, both here and on the Continent, continues in a state of great prosperity, and, whilst the cotton market remains in its present state, large quantities of woollen goods will be required both for home use and export purposes.

The supplies of potatoes on sale are still very large, and the stocks in most of the leading districts are considerably in excess of last year. The quality of most kinds is good. The demand has been moderate, and, in the Metropolis, the quotations have ranged from 40s. to 95s. per ton. At this period in 1863, the best samples were worth 120s. per ton. The supplies on the Continent are represented as nearly equal to last season.

The supplies of both hay and straw on offer have been tolerably extensive; very little change has taken place in the quotations; but the demand has been somewhat restricted. Meadow hay has sold at from £3 to £4 10s., clover £4 to £5 10s., and straw £1 2s. to £1 10s. per load. The quantity of

hay in stack is very moderate for the time of year; but the quality of the supply is very superior.

Fat stock having come to hand in prime condition, the tallow market has been in a most inactive state. In prices, however, very little change has taken place. Rough fat has changed hands at 2s. 1½d. and 2s. 2d. per lb. The stock of tallow in London is over 54,000 casks, against 44,000 casks last year.

The supplies of both English and foreign hops are now much reduced. On the whole, the hop trade is firm, at steady currencies. The imports from New York have been on a full average scale.

In Scotland the wheat trade has been in a sluggish state; nevertheless, the fluctuations in prices have been trifling. Barley, and most other kinds of spring corn have changed hands slowly, and the quotations have been with difficulty supported. The shipments of potatoes to the south have been on a full average scale.

The Irish markets have been but moderately supplied with wheat, yet all kinds have met a dull enquiry, at barely stationary prices. Other descriptions of produce have ruled heavy, and somewhat cheaper.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The various markets having been seasonably well supplied with beasts, both as to number and quality, the demand for most breeds has been less active than in the previous month, and the quotations have had a drooping tendency. The enquiry for sheep has somewhat fallen off, and inferior breeds, especially those out of the wool, have moved off slowly, on lower terms. The best old Downs in the wool have realised 6s., out of the wool 4s. 8d. to 4s. 10d. per 8lbs. The lamb season has opened tolerably well, although the weather has not favoured the consumption of lamb. Prices have ranged from 6s. 8d. to 8s. per 8lbs. The fall of lambs has, we understand, been somewhat large. No change of importance has taken place in the value of calves. On the whole, however, the veal trade has continued rather inactive. Pigs have ruled about stationary, with a slow enquiry.

Most of our correspondents state that, although the supplies of food on hand are only moderate, stock, generally, has fattened somewhat rapidly—that the number of beasts, both in England and Scotland, is large, and that the losses from disease have been small, compared with some previous years. We may, therefore, anticipate the arrival, in the metropolis, of good supplies of stock during the present year. In Holland, both beasts and sheep are tolerably abundant. From the high rates ruling in our markets, and the enormous consumption going on, the shipments will, no doubt, be large during the coming season. We may observe, however, that, during the past month, the imports of sheep from the Continent have shown a falling-off in quality.

Beef has changed hands at from 3s. 4d. to 5s., mutton 3s. 8d. to 6s., lamb 6s. 8d. to 8s., veal 4s. to 5s. 4d., and pork 3s. 6d. to 4s. 6d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	March, 1860.		March, 1861.	
	s. d.	s. d.	s. d.	s. d.
Beef..... from	8 4	to 4 10	..... 3 2	to 5 0
Mutton	4 0	to 6 0	..... 3 6	to 6 0
Veal	3 10	to 5 8	..... 5 0	to 6 0
Pork	3 4	to 4 4	..... 4 0	to 4 10
	March, 1862.		March, 1863.	
	s. d.	s. d.	s. d.	s. d.
Beef..... from	3 2	to 4 6	..... 3 4	to 5 0
Mutton	3 4	to 5 6	..... 3 6	to 6 2
Veal	4 4	to 5 6	..... 4 2	to 5 6
Pork	3 8	to 4 8	..... 3 8	to 4 8

Large supplies of Scotch and country-killed meat have been on sale in Newgate and Leadenhall, and a full average business has been transacted, on rather lower terms. The best beef has sold at 4s. 2d. to 4s. 4d., and the best mutton 4s. 6d. to 4s. 8d. per 8lbs., by the carcase.

STALLIONS FOR THE SEASON, 1864.

[NONE BUT THOROUGHBRED HORSES ARE GIVEN IN THIS LIST].

Name.	Colour.	Age	Pedigree.	Performances.	Principal Performances.	No. Winners out by	Sire of	Standing at	Apply to	Price.
Adams	bay	10	by Touchstone, out of Ada Mary, by Bay Mid-dleton	started 52, won 6	ran third for the Derby	1	Miss Nightingall	Rawcliffe Paddocks...	T. Bateson	10 gs.
Alfredson	bay	5	by Tadmor, out of Crosslase, by Siane	started 11, won 4	won New Stakes at Ascot	untried.	—	Castle Lane, Bedford ..	J. M. Lemnan ..	6 gs., h. b. £2 5s.
Amrose	black	15	by Touchstone, out of Annette, by Prism	started 19, won 10	—	11	Cynicus	Burleigh, Stamford ..	Mr. H. Rose	20 gs.
Amsterdam	bay	9	by The Flying Dutchman, out of Urania, by Idle Boy	by started 46, won 14	won Chesterfield Plate..	untried.	—	Middle Park, Eitham ..	Mr. Blenkinson ..	10 gs.
Ancient Briton	chestnut	9	by Colchester, out of Ellen Horse, by Redbank	started 25, won 4	won Liverpool Cup	untried.	—	Bronyard	Mr. Devereux ..	7 gs.
Annesdale	chestnut	22	by Touchstone, out of Rebecca, by Lottery	started 15, won 3	ran second for Derby...	53	Apathy	Holliday's Stables, Lockerton, N.H.	Mr. R. Scott	7 gs.
Anthrax	brown	12	by Melbourne, out of Fausta, by Dr. Faustus	started 6, won 1	—	untried.	—	Lockerton, Radnorshire	R. Griffiths, V.S.	5 gs., h. b. 2 gs.
Arthur Wellesley	bay	13	by Melbourne, out of Lady Barbara, by Laurence	started 7, won 1	at Manchester	untried.	—	Richmond, York	Mr. Wright	6 gs.
Athleta	brown	14	by Birdcatcher, out of Lucy Dashwood, by Sheet Anchor	started 1, won 13	won Cleveland Handicap	untried.	—	Orlingbury, Wallingbro'	Mr. Manning ..	15 gs.
Audubon	bay	14	by Birdcatcher, out of Lucy Dashwood, by Sheet Anchor	started 30, won 13	won Cleveland Handicap	untried.	—	Cregs, Ireland	—	5 sovs., h. b. 3 sovs.
Augur	chestnut	15	by Birdcatcher, out of Nickname, by Ithmael	started 4, won 3	won Two-year-old Stakes	untried.	—	Boston	Mr. P. Smith ..	3 gs.
Autocrat	bay	13	by Bay Middleton, out of Empress, by Emilia	started 5, won 3	won £200 at Newmarket	21	Soothsayer	Lymington	Mr. Thora	10 gs.
Backbitter	brown	19	by Gladiator or Don John, out of Scandal, by Solim	started 24, won 9	won Goodwood Stakes ..	3	Sabbler	Warley, Knutsford ..	—	—
Barbatus	bay	14	by Bay Middleton, out of Barbara, by Lanercost	started 19, won 2	received 2 forfeits	3	Mint	Doncaster	Mr. Cunningham	10 sovs.
Beadman	brown	9	by Washburn, out of Mendicant, by Touchstone	started 12, won 6	won the Derby	1	Mulberry	Loyburne, Maidstone..	—	25 gs.
Ben Webster	bay	7	by Barron, out of Bushdew, by The Prime Warden	started 31, won 9	won Chester Cup	untried.	—	Fairfield Stud Farm, York	Mr. Thompson ..	10 gs.
Big Ben	brown	6	by Elshbert, out of Peobe, by Touchstone	started 15, won 8	won Mostyn Stakes	untried.	—	Svecliffe, Banbury	Mr. Gulliver	12 gs.
Bird on the Wing	black	11	by Birdcatcher, out of Prairie Bird, by Touchstone	started 16, won 1	—	1	First Flight	Doncaster	Mr. Cunningham	10 sovs.
Bonnie Prince	bay	7	by King Tom, out of Balmoral, by Lanercost	started 3, won 1	—	untried.	—	Tring Station	Mr. J. Brown ..	10 gs.
Bonyfield	bay	5	by West Australian, out of Queen Mary, by Melbourn	never appeared ..	—	untried.	—	Pocklington, York	Mr. T. Baker ..	7 gs.
Brocket	bay	14	by Gladiator	—	—	untried.	—	Dorset, Totnes	Mr. Watson	9 gs.
Bucasser	bay	7	by Wild Dayrell, dam by Little Red Rover	started 7, won 3	won Royal Hunt Cup ..	7	Sie Hugh	Nasham, Darlington ..	Stud groom	19 gs.
Burkham	bay	5	by Voltigeur, dam by Ithmael	started 19, won 10	won Royal Hunt Cup ..	untried.	—	Nunham, Newarket ..	W. Gilbert	—
Caban	bay	6	by Kingston, out of Hag, by Cow	started 14, won 5	won Buckenham Stakes	untried.	—	Southley, Datchet	R. Howe	7 sovs., h. b. 24 sovs.
Casario	bay	6	by Stockwell, out of Syphax, by Touchstone	started 41, won 7	won £100 at Oxford	untried.	—	Stockbridge	Mr. Young	13 gs., h. b. 6 gs.
Cambolis	chestnut	11	by Melbourne, out of Lady Lurwell, by Horrace	started 5, won 2	won Doncaster Stakes ..	untried.	—	Cawston, Rugby	Stud groom	13 gs., h. b. 6 gs.
Cape Fitzroy	chestnut	13	by The Emperor, dam by Economist	started 8, won 2	won Metrop. Handicap	7	Little Lady	Allerton, Pickering ..	Mr. Webster	10 gs.
Cassiope	brown	6	by The Flying Dutchman, out of Cascon	started 50, won 13	won Doncaster Stakes ..	untried.	—	Knowley, Prescott	Mr. T. Pophaw ..	55 gs.
Cassiope	bay	6	by Kingston, out of Defiance, by Defiance	started 9, won 2	won the Derby	untried.	—	Croome, Worcester	—	7 gs., h. b. 8 gs.
Castler	bay	6	by Rigmart, out of Comfit, by Foremast	started 14, won 4	won Newmarket H. £1,095	untried.	—	Aske, Richmond	—	10 gs.
Castler	bay	6	by Stockwell, out of Selina, by Orford	started 3, won 1	won Finsbury Stakes ..	untried.	—	Hooks, Chester	—	10 gs.
Cavendish	brown	8	by Voltigeur, out of The Countess of Burling-ton, by Touchstone	started 5, won 1	won Convivial Stakes ..	untried.	—	Croft, Darlington	Mr. T. Winter-	15 gs. (10 mares)
Cawood	bay	9	by The Oure, out of Brandy Soap, by Muley	started 11, won 1	won a Plate at Newton..	untried.	—	Highfield, Burton-on-	J. Jordan	15 gs.

Calabria	bay	5	by Pandemon, out of Hable, by The Provost	started 27, won 9	won £100 at Brighton	untried.	sunbeam	Boynton	Mr. A. Fisher	7 sovs.
Calcutta	grey	6	by Birdcatcher, out of Whim, by Dromed	started 27, won 9	won Dromed Cup	5	Phaenopis	Bridge, Sussex	T. Hodgson	12 gs.
Cambridge	chestnut	10	by Orancho, out of Industry, by Frian	started 14, won 5	won the Greatwick	5	Blaney	Bosse Hill, Stafford	Messrs. Painter	30 gs.
Campan	chestnut	8	by Stockwell, out of Little Fairy, by Hercules	started 8,	won G. Duke Michael ..	untried.	Shaffo	Cowbridge	Mr. Ballard	10 gs.
Campan	chestnut	12	by Touchstone, out of Mountain Sylph, by	started 27, won 8	won the Woodcock stakes	4	Outaway	Boston Lodge, the	Mr. Clancy	10 gs.
Campan	chestnut	16	by Lanercost, dam by Tomboy	started 33, won 7	won Liverpool Cup	12	Glauca	Mr. Richardson's, Cal-	W. Cartwright	10 gs.
Campan	bay	10	by Alorna, out of Dinah, by Clarion	started 25, won 5	won the Woodcock stakes	1	Underland	Merich Bridge	Stud groom	20 gs.
Campan	bay	8	by Touchstone, out of Days of Yore, by Old	started 1,	won the Derby	80	Klarckoff	Swadcliffe, Hambury	Mr. Gulliver	4 gs.
Campan	bay	94	by Touchstone, out of Emma, by Whisker ..	started 11, won 2	won the Derby	untried.	Tolarno	Althorp, Northampton	T. Wilson	10 gs.
Campan	bay	7	by Andover, out of Hazlet, by Mango	started 31,	won Zealand Herald ..	untried.	Bellman	Spring Cottage, Malton	Mr. W. Panson	5 gs.
Campan	bay	23	by Orlando, out of Vesuvius, by Gladiator ..	started 11, won 3	won the Ascot Stakes ..	untried.	Stud Farm, Enfield	Mablethorpe, Exeter	Mr. Maslo	15 gs.
Campan	bay	7	by Phylax, out of Vesuvius, by Medico	started 95,	won the Claret	38	Dorchester	Carterick Bridge	Wm. Cartwright	20 gs.
Campan	bay	8	by Newminster, out of Lianora, by Ballinabre	started 43, won 10	won Gs. Finto, Carlisle ..	untried.	Whitwell, Clibberoe	Kilminchy, Maryboro' ..	4 gs., h. b. 3 gs.	
Campan	bay	18	by Touchstone, out of Miss Bore, by Canton ..	started 4, won 3	won Newmarket Stakes ..	10	Stud Farm, Enfield	Knowsley, Prescot	Mr. T. Forshaw	10 gs., h. b. 5 gs.
Campan	bay	15	by Old England, out of Vexation, by Touch-	started 5, won 17	won Northampton Stakes	4	Ensoers Repository	Bromyard	Mr. Devereux	7 1/2 gs.
Campan	bay	9	by Pontifex, out of Countess of Derwentwater,	started 41, won 13	won Stockton Handicap ..	untried.	Dunkeld	Whitwell, Clibberoe	R. Heselme	10 gs.
Campan	chestnut	6	by Orlando, out of Equitation, by Emilius	started 10, won 6	won the 2,000 gs. Stakes ..	untried.	Ballman	Stud Farm, Enfield	Mr. H. Goodchild	10 gs. (30 mares)
Campan	chestnut	12	by Birdcatcher, out of Dublin, by New John ..	started 22, won 7	won £160 at Curragh ..	8	Blacklock	Bellewstown Racecourse ..	6 gs., h. b. 3 gs.	
Campan	chestnut	4	by Voligent, out of Catinette, by Don John ..	never appeared ..	won 8 Royal Plates	untried.	Marabout	Gilpin Wood Richmond ..	J. G. Simpson	6 gs., h. b. 3 gs.
Campan	chestnut	7	by Mountain Deer, out of Devotion, by Hark-	started 18, won 12	won 8 Royal Plates	untried.	Blacklock	Stand House, Curragh ..	Mr. Dunne	5 gs., h. b. 3 sovs.
Campan	bay	10	by Bay Middleton, out of Defenceless, by De-	never appeared ..	won the Derby	untried.	Blacklock	Dorchester	Ensoers Repository ..	5 sovs., h. b. 3 sovs.
Campan	chestnut	10	by Big Jerry or Weatherbit, out of Elspeth, by	started 10, won 2	won the July	1	Dunkeld	Boythorpe, Chesterfield ..	H. Bird	10 gs., h. b. 5 gs.
Campan	bay	6	by Lord of the Isles, out of Marmalade, by	started 8, won 6	Second for the Derby ..	untried.	Marabout	Middle Park, Eltham	Mr. Blankin	80 gs.
Campan	chestnut	9	by The Flying Dutchman, out of Dame Cosser,	started 48, won 12	won Westminster P. (2) ..	untried.	Blacklock	Ravcliffe Paddocks	T. Bateson	10 gs.
Campan	chestnut	14	by Pantaloon, out of Decoy, by Filbo da Puta ..	never appeared ..	won 4 Queen's Plates ..	3	Blacklock	Mumhead, Exeter	Mr. Maslo	10 gs.
Campan	chestnut	5	by Wild Dayrell, out of Circassian Maid, by	started 25, won 7	won the Derby	8	Blacklock	Willesden Paddocks	Mr. C. Phillips	10 gs., h. b. 5 gs.
Campan	chestnut	11	by The Flying Dutchman, out of Elledale, by	started 10, won 3	won the Derby	untried.	Blacklock	Willesden	Mr. C. Phillips	15 gs.
Campan	chestnut	16	by Touchstone, out of Gulhane, by Physician	started 11, won 2	won £50 at Chester	untried.	Blacklock	Foxholes, Lancaster	—	5 gs., h. b. 3 gs.
Campan	bay	4	by Stockwell, out of Countess of Albenmarle ..	started 4,	won the Epsom Handcap ..	1	Blacklock	Stud Farm, Enfield	H. Goodchild	10 gs. (40 mares)
Campan	bay	12	by Beverlee, out of Slender, by Longwaist	started 9, won 4	won the Angleways	untried.	Blacklock	Brenchley, Kent	Jas. Calton	5 gs., h. b. 3 gs.
Campan	bay	7	by Mountain Deer, dam by Ismael	started 6, won 2	won the Northumberland	1	Blacklock	North Grimsby, Malton ..	J. Harrison	5 gs., h. b. 3 gs.
Campan	chestnut	9	by Lord Fauconberg, out of Maid of Team	started 35, won 8 1/2	won the Derby	untried.	Blacklock	Bodicot, Hambury	Mr. B. Austin	7 gs.
Campan	chestnut	6	by Orlando, out of Stamp, by Emilius	started 15, won 3	won 2,000 Gs. Stakes ..	untried.	Blacklock	Newmarket	Messrs. Barrow	10 gs.,
Campan	chestnut	6	by Birdcatcher, out of Lady Laurewell, by	started 19, won 10	won the Chesterwell Stakes	untried.	Blacklock	Warford, Knutsford	—	10 gs., winners 6s.
Campan	bay	18	by Beverlee, out of Elfida, by Elis	started 53, won 10	won 2nd for Goodfwd. Stk.	untried.	Blacklock	Stud Farm, Enfield	Mr. H. Goodchild	10 gs., h. b. 5 gs.
Campan	chestnut	8	by The Conack, out of Gaiety, by Touchstone ..	started 18, won 8	won the St. Leger	untried.	Blacklock	Coll. Monrath, Ireland	—	2 gs.
Campan	chestnut	10	by Sir Hercules, out of Snowdrop, by Heron ..	started 33, won 18 1/2	won second for Ascot Cup ..	6	Blacklock	Beisy, Newcastle-on-Tyne ..	T. Ewart	7 sovs., h. b. 2 sovs.
Campan	bay	7	by Kingston, out of Mulligrub, by Melbourne ..	started 10, won 4	won £100 (h) Curragh ..	untried.	Blacklock	Mumhead, Exeter	Mr. Maslo	30 gs.
Campan	bay	7	by Kingston, out of Mulligrub, by Melbourne ..	started 10, won 4	won £100 (h) Curragh ..	untried.	Blacklock	Causeway, Navan	—	5 gs.

STALLIONS FOR THE SEASON 1864—(Continued).

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of Winners out by	Sire of	Standing at	Apply to	Price.
General Williams	bay	10	by Womersley, out of Lady Elizabeth, by Slight of Hand	started 15, won 4	won £183 at Manchester	4	Captain Crowe	Newmarket	Messrs. Barrow	15 gs.
Gibraltar	bay	37	by Muley out of Young Sweet Pea, by Godolphin	started 9, won 5	won the Port	4	Malta	Warden, Biggleswade	T. Morgan	10 gs.
Goodwood	bay	4	by Mr. Milner, out of Prairie Bird, by Gladiator	never appeared	---	untried.	---	44, Cross-st., Finsbury	Mr. A. Lawes	6 gs.
Glenmasson	bay	10	by Cocherstone, out of Annette, by Priam	started 11, won 5	won Stwd's, Cp. Goodwood	untried.	---	Warden, Biggleswade	T. Morgan	10 gs.
Great Unknown	brown	19	by Voltaire, out of The Princess, by Stane	never appeared	---	---	---	Oldbury, Atherstone	J. Evans	30 gs.
Gunboat	brown	10	by Sir Hercules, out of Yard-arm by S. Anchor	started 18, won 8	won Cleveland Handicap	untried.	---	Busbury, Wolverhampton	Mr. Daly	30 gs. (30 mares)
Hoffj, The	bay	9	by Faugh-a-Ballagh, out of Athol Bross, by Orlando	by started 8	ran second for St. Leger	untried.	---	Hooton, Chester	John Griffiths	10 gs.
Harbinger	black	15	by Touchstone, out of Cuckoo, by Ellis	started 30, won 10	won Chesterfield Cup	3	Cuckoo	Cross Roads, Screen	Messrs. Weatherby	5 gs.
High Treason	chestnut	7	by Mildew, out of The Gipsy Queen, by Tomboy	started 19, won 5	ran second for Leger	untried.	---	Esby Abbey, Richmond	Messrs. Weatherby	10 gs.
Hobble Noble	bay	15	by Pantaloon, out of Phryne, by Touchstone	started 14, won 5	won New Stakes	13	Morryman	Clauston, Rugby	---	10 gs.
Horror	brown	7	by Wild Dayrell, out of Sally, by Ithuriel	started 9, won 3	won Ascot Vase	untried.	---	Middle Park, Eltham	Mr. Blenkiron	10 gs.
Hospital	chestnut	13	by Hetman Platoff, out of Infidelity, by Voltaire	started 36, won 14	won £240 at York	11	Wee Polly	Ballinakil, Ireland	---	4 sovs.
Habert	bay	5	by Stockwell, out of Honeydew, by Touchstone	started 12, won 2	won £270 at Newmarket	untried.	---	Whitehall, Clitheroe	R. Heseltine	10 gs.
Hungerford	chestnut	16	by John O'Gaunt, out of Miss Ety, by Saddler	by started 67, won 17	won York Handicap (2)	untried.	---	Cholwell, Totnes	Mr. Watson	2 gs.
Ignoramus	bay	10	by The Flying Dutchman, out of Ignorance, by The Little Known	by started 19, won 12	won P. of Wales Stakes	2	Folly	Minton, Wem, Salop	Mr. Clay	10 sovs., h. b. 5 sovs.
Indifference	chestnut	9	by Birdcatcher, out of Sangfroid, by Gameboy	started 30, won 4	won York Biennial	untried.	---	Warford, Knutsford	---	10 gs., h. b. 2 gs.
Ivan	brown	13	by Van Tromp, out of Siberia, by Brantford	started 15, won 5	won £400 at Newmarket	5	Union Jack	The Curragh	Mr. Dunne	10 gs.
Joskin	brown	8	by West Australian, out of Passant Girl, by The Major	by started 35, won 6	won a Queen's Plate	untried.	---	Winkfield, Windsor	Mr. Nelson	10 sovs.
Jordan	bay	9	by Jericho, out of Guarucho, by Sheet Anchors	started 11, won 1	won Liverpool Leger	1	Mahometan	Press, Salop	T. A. Wilkinson	7 gs., h. b. 3 gs.
Kentucky	brown	11	by Micky Free, out of Indiana, by Muleyn	by started 18, won 6	won the Derby	untried.	---	Lalcester	Messrs. Bailey	5 gs., 2 gs.
Kathedrum	chestnut	6	by Batsphan, out of Hylia, by The Provost	started 8, won 4	won the Derby	untried.	---	Whitehall, Clitheroe	R. Heseltine	30 gs.
Kildonn	bay	6	by Newminster, out of Shamrock, by Yg. Priam	started 16, won 6	won 300 at Newmarket	untried.	---	Bourlstone, Cardiff	D. Griffiths	5 gs., h. b. 3 gs.
King Brian	bay	11	by Gospor, dam by Ismael, out of Mignonette, by Pion	started 6, won 4	won the Champagne Sts.	untried.	---	Harewood, Leeds	W. Gadsby	10 gs., h. b. 3 gs.
King of Diamonds	chestnut	7	by King Tom, out of Emerald, by Defence	started 47, won 11	won the Champagne Sts.	untried.	---	Manmore, Bucks	Mr. Markham	10 gs.
King of the Forest	bay	10	by Orlando, out of Forest Flower, by Glaucon	started 61, won 21	won (h) Newmarket	untried.	---	Newmarket	Messrs. Barrow	10 gs.
King of Kent	chestnut	8	by Euboea, out of Scalded, by Touchstone	started 27, won 9	won Hungerford S.	untried.	---	Hooton, Chester	---	10 gs.
King of Trompe	chestnut	15	by Valciopede, out of Mrs. Gill, by Victor	started 47, won 13	won the Port	13	Doefoot	Root, Clitheroe	R. Heseltine	25 gs.
King Tom	bay	13	by Harwaray, out of Pocahontas, by Gloucon	started 6, won 3	ran second for Derby	39	Old Chabbar	Manmore, Bucks	C. Markham	50 gs.
Knight of Aynon	chestnut	17	by The Doctor, out of Blue Bommel, by Touchstone	started 6, won 4	won the Port	15	Pitman	Lady-Kirk, N.B.	C. Bolton	9 sovs., h. b. 3 sovs.
Knight of Gwynne	brown	17	by Gilbert Gurney, out of Sewweed, by Sharn	started 17, won 5	won Newton St. Leger	3	Slatern	Belmont, East Barnet	Mr. S. Hornby	10 gs.
Knight of Khari Bay	bay	9	by Sateith, out of Pocahontas, by Gloucon	started 10, won 2	won Whitley Stakes	1	Lady Williams	Stanton, Shifnal	Mr. Eyles	15 gs.
Knight of St. bay	bay	6	by the Knight of St. George, out of Pocahontas	started 29, won 4	won the Colum	untried.	---	Burglady, Stamford	---	30 gs.
Parrot	chestnut	6	by the Knight of St. George, out of Ava, by Gloucon	by started 5, won 3	won Wothorpe Biennial	untried.	---	Burglady, Stamford	---	10 gs.
U. of the Thistle	chestnut	5	by Stockwell, dam by Orlando	started 7, second, ft. ran third for 5,000 gm.	---	untried.	---	Burglady, Stamford	Mr. Cunningham	7 sovs.

Kah-noor	chessnut	16	by The Isles, out of Miss Kitty Cockey, by started 17, won 4	won 4	Cheshire Stakes	4	untried.	Coronet	Swalcliffe, Banbury	Wolver- hampton, Diss	Mr. Dady	10 gr., h. b. 2 gr.
Laertes	bay	5	by Pindar, out of Boarding School Miss, by started 7, won 4	won 4	£600, Newmarket	0	untried.	The Pilot	Owaby, Belg	Swalcliffe, Banbury	Mr. J. Ashton	10 gr.
Lambton	bay	14	by The Cure, out of Hippine, by Emilius... started 36, won 10	won 10	York County Plate	0	untried.	Coop d'Etat	Cricklinton, Carlisle	Swalcliffe, Banbury	Mr. J. Ashton	40 gr.
Laughing Stock	bay	6	by Stockwell, out of Gaiety, by Touchstone... started 10, won 4	won 4	£200, Newmarket	2	untried.	Lord of the Isles	Kewcliffe, York	Swalcliffe, Banbury	Messrs. Moffat	15 gr.
Leamington	brown	11	by Faugh-a-Ballagh, dam by Pantaloon... started 35, won 7	won 7	Chester Cup (3)	3	untried.	Dundas	Banbury, Wolver- hampton	Swalcliffe, Banbury	J. Dady	80 gr. (45 mares)
Lifebest	brown	9	by Sir Hercules, out of Yard Arm, by Sheet Anchor	won 15	Metropolitan Stakes	9	untried.	Wallice	Swalcliffe, Banbury	Swalcliffe, Banbury	J. Christian	30 gr.
Lord of the Isles	bay	13	by Touchstone, out of Fair Helen, by Pantaloon... started 10, won 4	won 4	£2,000 gr. Stakes	9	untried.	Princess Royal	Swalcliffe, Banbury	Swalcliffe, Banbury	Mr. Gulliver	10 sovs., h. b. 5 sovs.
Lord of the Soil	bay	4	by Lord of the Isles, out of Golconda, by I. Birdcatcher	never appeared ..			untried.	Twinkie	Swalcliffe, Banbury	Swalcliffe, Banbury	Mr. Gulliver	10 sovs., h. b. 5 sovs.
Lough Bawn	chessnut	16	by Magpie, out of Surprise, by Rough Robin... ran 50, won 11	won 11	485 Kello	18	untried.	Fairwater	Redlands, Reading	Swalcliffe, Banbury	Mr. West	3 gr.
Loop-garou	brown	18	by Lanercost, out of Moonbeam, by Tomboy... started 17, won 3	won 3	£25 ft.	18	untried.	Princess Royal	Ordingbury, Northampton	Swalcliffe, Banbury	Mr. J. Dibbin	15 gr.
Lovett	black	8	by The Confessor, out of Julia, by Jerry... started 17, won 3	won 3	Orford Stakes	3	untried.	Princess Royal	Warford, Northampton	Swalcliffe, Banbury	J. Manning	10 gr., h. b. 5 gr.
Lynx	bay	9	by Loop Gascon, out of Bithday, by Pantaloon... started 16, won 4	won 4	Ascot Biennial Stks.	4	untried.	Princess Royal	Owaby Pad, Brigg	Swalcliffe, Banbury	J. Ashby	10 gr., h. b. 5 gr.
Magnan	chessnut	9	by Surplice, out of Emerald, by Daines... started 15, won 2	won 2	£500 at Stockbridge	2	untried.	Princess Royal	Bebbus, Romford	Swalcliffe, Banbury	Mr. Church	5 gr., h. b. 3 gr.
Maintance	bay	7	by King Tom, out of Ellister, by Bay Mid- dion	started 10, won 2	£500 at Stockbridge	2	untried.	Princess Royal	Sheffield-Jane Paddock	Swalcliffe, Banbury	Mr. Croft	5 gr.
Melchin	chessnut	21	by The Doctor, out of Myrrha, by Malek... started 8, won 2	won 2	Prince of Wales St.	18	untried.	Princess Royal	Whitson Paddock	Swalcliffe, Banbury	Mr. C. Phillips	10 gr.
Melchior	bay	3	by Touchstone, out of Ghuznee, by Pantaloon... started 6, won 1	won 1	dead heat for Nursery	1	untried.	Princess Royal	Kirkinton, Carlisle	Swalcliffe, Banbury	Messrs. Moffat	5 gr.
Mercy Hill	brown	13	by Melbourne, out of Mowra, by Touchstone... started 4, won 1	won 1	£250, Newcastle	1	untried.	Princess Royal	Lynton	Swalcliffe, Banbury	Mr. Thorne	12 gr.
Mercutio, The	chessnut	16	by Touchstone, out of Marion, by St. Martin... started 5, won 1	won 1	second for the Derby	4	untried.	Princess Royal	Cross Roads, Skreene	Swalcliffe, Banbury	5 gr., h. b. 3 gr.	
Marquis, The	chessnut	16	by Birdcatcher, out of Ellen, by Birdcatcher... started 36, won 13	won 13	Angloese	4	untried.	Princess Royal	Ireland	Swalcliffe, Banbury	Mr. J. Pearson	15 gr.
Marquis, The	bay	5	by Stockwell, out of Cimbelli, by Touchstone... started 8, won 7	won 7	St. Leger	3	untried.	Princess Royal	Dringhouses, York	Swalcliffe, Banbury	Mr. Elckiron	15 gr.
Marys	chessnut	13	by Orlando, out of Malbran, by Whisker... started 7, won 3	won 3	July Stakes	3	untried.	Princess Royal	Middle Park, Eltham	Swalcliffe, Banbury	Mr. Elckiron	7 gr.
Master Ragot	grey	10	by Faugh-a-Ballagh, out of Victarine, by Speculation	started 72, won 19	£480 (h) Newton	19	untried.	Princess Royal	Michel Grove, Worthing	Swalcliffe, Banbury	Mr. Elckiron	7 gr.
M. D.	brown	10	by The Cure, out of Theano, by Waverley... started 11, won 3	won 3	Nursery	3	untried.	Princess Royal	Mountainslow, Meath	Swalcliffe, Banbury	Mr. Ransom	6 sovs., h. b. 3 sovs.
Mentmore	bay	9	by Melbourne, out of Emerald, by Defence... started 34, won 11	won 11	the Prindergat	11	untried.	Princess Royal	Hampion Court	Swalcliffe, Banbury	Mr. H. Rose	10 gr.
Midas	chessnut	16	by Belrain, out of Merope, by Voltaire... started 25, won 9	won 9	Newmarket St. Leger	6	untried.	Princess Royal	Burgley, Stamford	Swalcliffe, Banbury	Mr. R. Wright	15 gr.
Mildew	chessnut	17	by Slane, out of Semileris, by Voltaire... started 21, won 10	won 10	Ascot Vase	10	untried.	Princess Royal	Richmond, York	Swalcliffe, Banbury	Mr. R. Scott	3 gr.
Mimot	bay	—	an Arabian	ran well in India.			untried.	Princess Royal	Halfheads, Lockerbie	Swalcliffe, Banbury	Mr. J. Dawson	5 gr., h. b. 2 gr.
Mira Mahomed	bay	—	an Arabian, imported in 1836				untried.	Princess Royal	Newmarket	Swalcliffe, Banbury	Mr. J. Dawson	5 gr., h. b. 2 gr.
Hamid Allee	bay	16	by Hetman Platoff, dam by Camel	started 10, won 3	Cesarewitch	3	untried.	Princess Royal	Badminton	Swalcliffe, Banbury	S. Brown	19 gr.
Muscovite	bay	6	by Newmaster, out of Peggy, by Muley Moloch... started 8, won 3	won 3	the Derby	3	untried.	Princess Royal	Middlethorpe, York	Swalcliffe, Banbury	Mr. Smallwood	12 gr. (40 mares)
Musjid	brown	6	by Newmaster, out of Peggy, by Muley Moloch... started 8, won 3	won 3	the Derby	3	untried.	Princess Royal	Middle Park, Eltham	Swalcliffe, Banbury	Mr. Elckiron	10 gr., h. b. 5 gr.
Neasam	bay	16	by Hetman Platoff, out of Wasp, by Muley Moloch... started 17, won 5	won 5	Northumberland P.	11	untried.	Princess Royal	Fairfield, York	Swalcliffe, Banbury	Mr. Jackson	10 gr.
Neptune	brown	5	by Weatherbit, out of Athena Pallas, by Bird- catcher	won 5	Omnival Stks. York	5	untried.	Princess Royal	Swalcliffe, Banbury	Swalcliffe, Banbury	Mr. Gulliver	15 gr.
Neville	bay	13	by Napier, out of Sally Snobs, by Sandbeck... started 16, won 7	won 7	St. Northern Hand.	11	untried.	Princess Royal	Swalcliffe, Banbury	Swalcliffe, Banbury	Mr. Gulliver	15 gr.
Newcastle	chessnut	8	by Newmaster, out of Mary Alabais, by Mal- colm	started 52, won 16	Doncaster Cup	16	untried.	Princess Royal	Park Paddock, New- market	Swalcliffe, Banbury	Mr. Gulliver	10 gr.
Newmaster	bay	16	by Touchstone, out of Beeving, by Dr. Strytar... started 10, won 3	won 3	St. Leger	3	untried.	Princess Royal	Rawcliffe, York	Swalcliffe, Banbury	Mess. Weatherby	Full.
Newman-le- Willows	brown	10	by Melbourne, out of Leaping, by Buisard... started 19, won 3	won 3	Kirran Handicap	3	untried.	Princess Royal	Limerick	Swalcliffe, Banbury	Mess. Weatherby	5 sovs., h. b. 3 sovs.
North Lincoln	bay	8	by Pyiades, out of Cherokee, by Redbank... started 21, won 17	won 17	the Criterion	17	untried.	Princess Royal	Memmore, Bucks	Swalcliffe, Banbury	C. Martham	10 gr.
Nottingham	bay	7	by Kingston, out of Alcool Bross, by Orlando... started 4, won 3	won 3	the 300 gr.	3	untried.	Princess Royal	Banham, Newbury	Swalcliffe, Banbury	J. Christian	10 gr., h. b. 3 gr.
Nottingham	chessnut	7	by Nabob, out of The Princess, by Merry Monarch... started 3, won 2	won 2	the 300 gr.	2	untried.	Princess Royal	Burgley, Stanforth	Swalcliffe, Banbury	Mr. Wyatt	50 gr. (40 mares)
Kurabal	brown	17	by Nutwith, out of Marmora, by Sultan... started 21, won 12	won 12	Newmarket St. Leger	12	untried.	Princess Royal	Burgley, Stanforth	Swalcliffe, Banbury	Mr. Wyatt	10 gr., h. b. 5 gr.
Old Calabar	bay	5	by King Tom, out of The Hippled Mare, by Picaroon	started 7, won 4	the Criterion	4	untried.	Princess Royal	Harleston/Northampton	Swalcliffe, Banbury	Mr. Wilson	15 gr.

STALLIONS FOR THE SEASON, 1864—(Continued).

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of winners out by.	Sire of	Standing at	Apply to	Price.
Old Robert	brown	8	by Robert de Gorham, out of Henrietta, by Merry Monarch	by started 6, won 1	won Newmarket H.	untried.	—	Rawliffe Paddocks	T. Batson	5 gs.
Optimist	chestnut	7	by Lexington, dam by Glencoe (bred in America)	by started 26, won 9	won Ascot Stakes	untried.	—	Hurstbourne, Whit-church	Mr. Milton	8 gs.
Gubston	bay	12	by Melbourne, out of Alice Hawthorn, by Muley Meloch	by started 11, won 7	won Queen's Vase	4	Rusley	Hasketon, Woodbridge	—	12 gs.
Oxford	chestnut	7	by Irish Birdcatcher, out of Honeydew, by Hemipteritary	by started 9, won 9	won £240 at York	—	—	Croft, Darlington	Mr. T. Wintering-ham	12 gs.
Palest	brown	12	by Touchstone, out of Canzon, by Melbourne	started 13, won 4	won £1,300 at Newmarket	—	—	Knowsley, Prescott	Mr. Forshaw	7 gs.
Parosian	brown	7	by Streetman, out of Graysby, by Verulam	started 28, won 10	won Great Metropolitan	untried.	—	Rufford Abbey, Ollerton	Mr. Coultas	5 gs.
Pellon	brown	14	by Ion, out of Mo. Mio, by Jerry	started 12, won 8	won Eclinton Stakes	12	Cryle	Middlethorpe, York	Mr. Smallwood	10 gs.
Peppermint	brown	15	by Streetman, out of Pantalome, by Pantalome	started 5, won 9	won Bedford Two-year-old	6	Malinsay	Atherston, Turporley	—	10 gs.
Petrumbl	chestnut	7	by Offwards, out of Virago, by Python the First	started 4, won 1	won match at Newmarket	untried.	—	Crome, Worcester	Mr. W. Hadley	5 gs., h. b. 2 1/2 gs.
Pleaser	bay	9	by Barston, out of Chastant, by Don John	started 19, won 4	won Stockton Claret Stakes	untried.	Ceres	Uplatham, Redcar	The Groom	5 gs., h. b. 2 gs.
Plum Pudding	brown	7	by Sweetman, out of Pinery, by Don John	started 8, won 5	won Molecomb Stakes	14	—	Kilnlock Limerick	—	5 gs., h. b. 2 gs.
Porto Rico	bay	11	by Sweetman, out of Fiontula, by Birdcatcher	started 27, won 5	won The Clearwell	untried.	—	Draus Hill, Stafford	Mr. Painter	7 gs., h. b. 3 gs.
Puttenger	bay	20	by Hemipteritary, out of Enterprise, by Defence	started 15, won 2	won £50 at Newmarket	untried.	—	Trales, Ireland	D. Sheehy	5 gs., h. b. 2 gs.
Prime Minister	brown	16	by Melbourne, out of Pantalome, by Pantalome	started 31, won 8	won the Port	14	Light	Highfield, St. Albans.	Jas. Fielding	25 gs. (40 mares)
Promised Land	bay	8	by Jetchu, out of Gies, by Touchstone	started 17, won 8	won the 2,000 Guineas	untried.	—	Floyton, Dis	—	20 gs.
Rangoon	chestnut	14	by Pantalome, out of Laughish, by Cain	started 1, won 1	—	untried.	—	Ardee, Co. Louth	C. Campbell	5 sovs., 2 sovs.
Rapparee	brown	6	by Ratanap, out of Lady Alicia, by Melbourne	started 20, won 3	won Ascot Stakes	untried.	—	Rawliffe Paddocks	T. Batson	10 gs.
Ratanap	chestnut	22	by Buzzard, dam by Fiction	started 7, won 3	won the Criterion	16	Malacca	Puddavin, Tonne	Mr. Barrett	5 gs., h. b. 2 1/2 gs.
Rattle	chestnut	14	by The Baron, out of Pochontas, by Glencoe	started 7, won 4	won 21 Royal Plates	23	Kettledrum	Pickhill Castle Farm	W. Harrshaw	40 gs. (\$5 mares)
Rattlebone	grey	7	by The Falow Buck, out of the Hambble, by Canal	started 71, won 2	—	6	Blackdown	Audler's Ash, Liss.	Mr. Ayling	10 gs.
Rinaldo	bay	9	by Cruiser, out of Wicket by Stumps	started 23, won 6	won £460 at Stockbridge	untried.	—	Harleston, Northampton.	Mr. Wilton	5 sovs.
Rochester	black	18	by Kingston, out of Kirtle, by Sultan	started 17, won 6	—	untried.	—	Debdon, Longiton, Essex	John Frenell	7 gs., h. b. 2 1/2 gs.
Rogue Dragon	chestnut	6	by Chatham, out of Margravine, by Little John	started 17, won 6	won £275 at Newmarket	12	Cowley	Water Tower, Rugby	Walker & Watson	10 gs., h. b. 3 gs.
Ruby	bay	13	by Windhound, out of Paradigm, by Paragon	started 7, won 4	ran dead heat, Goodwood	untried.	—	Beigham, Newbury	J. Christian	10 gs., h. b. 3 gs.
St. Albans	chestnut	7	by Bay Middleton, out of Crown Jewel, by Duke or Coronation	started 3, won 1	won Althorp Park S.	3	Rubbi	High Wycombe	Mr. T. Robinson	10 gs., h. b. 3 gs.
Sawnter	brown	6	by Stockwell, out of Bribery, by The Libel	started 8, won 5	won St. Lager	untried.	—	Bushy Paddocks, Hampton Court	Mr. Ranson	Full.
Schuloff	bay	8	by Idle Boy, out of Times, by Ion	started 26, won 7	won City and Suburban	untried.	—	Hooton, Chester	Groom	10 gs.
Simple Simon	brown	7	by The Cosack, out of Mabella, by Melbourne	started 5, won 1	won Tyro Stakes	untried.	—	Montharow, Diverson	R. Baily	10 gs., h. b. 3 gs.
St. Charles	bay	25	by Woodlign, out of Nicoline, by Ion	started 16, won 4	won Northampton Stakes	untried.	—	Harpendon, Herts	Mr. T. Archer	10 gs., h. b. 3 gs.
St. John Bates	chestnut	10	by Hatman Platoff, out of Mixx, by Humphrey Clunker	started 7, won 1	won Royal Hunt Cup	untried.	—	Thrafielder	Mr. Outwain	5 sovs., 3 sovs.
St. John Bayley	brown	15	by Robert de Gorham, out of Delaine, by Bay Middleton	started 23, won 12	won Epsom Cup	untried.	—	New Bour's Head, Manchester	Mr. John Bates	7 gs.
St. Peter Larcie	bay	20	by The Baron or Tamasi, out of Lovelip, by Canal	started 4, won 1	2nd Prize at Royal Show	1	Baron of Avon	Shermet, Henley-on-Thames	Mr. T. Hussey	6 gs., h. b. 3 gs.
Stromber	bay	10	by The Saddler, out of Well-a-Day, by Prian	started 25, won 8	won Ascot Cup	untried.	—	Cheltenham	Mr. W. Holman	5 gs. (40 mares)
Stonewall Dunhill	bay	14	by Voltigeur, dam by Gardcham	started 47, won 13	won Chesterfield H. P.	untried.	—	Rouffard, Ollerton	Mr. Coultas	10 gs.
			by Lago, out of Daughter of Toucar, by Bay Middleton	started 47, won 13	won Chesterfield H. P.	untried.	—	Abridge, Berkhamstead	Mr. Little	10 gs.

Somerset	brown ..	10	by Amadale, out of Eucharist, by Inberith	started 18, won 18	won £100 (h.), Newmkt	untried.	---	Stud Farm, Enfield.....	Mr. H. Goodchillo	10 gr., h. b. 5 gr.
Speaker, The.....	bay	8	by Fibert, out of Needs, by Canal.....	started 36, won 14	won £181 at Cardiff ..	untried.	---	Halling, Rochester.....	J. Parr	grays, h. b. 3 gr.
Sportman	bay	7	by Barkway, out of Tranquillity, by Venison.	started 31,	---	untried.	---	Weson Hall, Beccles.....	---	6 sovs., h. b. 3 gr.
Springwell.....	bay	7	by Barron, out of Julia, by Laurelot ..	started 31,	---	untried.	---	Sprague Hall, Hart, York.	Groom	5 gr., h. b. 3 gr.
Stampede	brown ..	5	by Alcott, out of Repentance, by Anandale ..	started 10, won 3	won Newmarketshire S.	untried.	---	Rawcliffe Paddock.....	Mr. T. Babson ..	10 gr.
Star of the West.	bay	5	by West Australian, out of Hophine, by Sir Hercules	started 10, won 3	won Oxfordshire Stakes	untried.	---	Chilton, Hungerford.....	Mr. Rickaby	5 gr., h. b. 3 gr.
Stockwell	chestnut	17	by The Baron, out of Pochontus, by Glencoe.....	started 91, won 19	won St. Leger.....	79	St. Albans.....	Hooton, Chester.....	John Griffiths	Full.
Storn	bay	16	by Touchstone, out of Ghornce, by Pantaloon	started 5, won 1	won £400 at Doncaster	13	Gauntlett.....	Lady Kirk.....	C. Balton	4 sovs., h. b. 3 sovs.
Strathern	bay	8	by Tadmor, dam by Slight-of-Hand	started 11,	---	untried.	---	Killmalkirk, Limerick	---	4 sovs.
Student, The.....	chestnut	19	by Touchstone, dam by Laurel	started 11, won 4	won £160 at Newmkt.	49	Salamanca.....	Buckham, Uxfield.....	Mr. J. Cook	6 gr., h. b. 3 gr.
Surplice	brown ..	13	by Touchstone, out of Crocidia, by Priam ..	started 16, won 9	won the Derby	untried.	Lady Clildon.....	Byngham, Pkfeld.....	Mr. J. Thora	15 gr.
Sycophant	bay	6	by Rutalpan, dam by Tomboy	started 44, won 8	won Surrey and Middlesex.	untried.	Alrediston.....	Wroughton, Swindon.	John Skirton.....	7 gr.
Tadnor	bay	18	by Ion, out of Palmyra, by Sallian	started 11, won 8	won Glatricks Stakes ..	47	---	Woydon, Diss.....	G. Sturgeon.....	5 gr.
Thornaby.....	chestnut	7	by Melbourne, out of Windhound,	started 24, won 14	won the Derby.....	untried.	---	Croft, Darlington.....	Mr. T. Winters.	30 gr. (40 mares)
Thunderbolt	chestnut	7	by Stockwell, out of Cordelia, by Red Deer ..	started 25, won 13	won the Stamford Plate	untried.	---	Newmarket	Mezra Barrow ..	30 gr.
Thun Bowline	bay	7	by The Flying Dutchman, out of Miss Bove, ..	started 13, won 4	won a Sweepstakes \$500.	untried.	---	Doncaster	Mr. Cunningham	10 sovs.
Touchwood	bay	8	by Touchstone, out of Beagle Bee, by Galanthus	never appeared ..	---	untried.	---	Highfield, St. Albans	Jas. Fielding.....	5 gr., h. b. 3 gr.
Tournaunt	bay	10	by Touchstone, out of Happy Queen, by Venison	started 36, won 18	won Steward's Cup	untried.	---	Hadeston, Northampton.	Mr. Wilkes	10 gr.
Tuxophilite	bay	9	by Longbow, out of Tugwain, by Pantaloon ..	started 18, won 11	Secured for the Derby ..	3	Ascham	Newmarket	Mezra Barrow ..	15 sovs.
Trumpeter	chestnut	8	by Orinda, out of Ouzelins, by Redbank ..	started 48, won 8	won Newmarket Biennial	untried.	---	Althorp, Northampton	T. White	Full.
Underhand	bay	19	by The Cure, out of Contractions, by Enallias ..	started 46, won 13	won Newmarket Plate (3)	untried.	---	Bawcliffe, York.....	Mr. T. Babson ..	10 gr.
Van Galen	brown ..	11	by Porcutt, out of Ensurpice, by De Vence ..	never appeared ..	---	untried.	---	Bawcliffe, York.....	Mr. T. Babson ..	10 gr.
Vandette	brown ..	11	by Van Tromp, out of Little Casino, by Aberior	started 6, won 6	won Two Stakes	1	Tim Whittier ..	Bairdsley, York.....	Mr. Meccaffo	3 gr.
Vengeance	bay	12	by Voltaire, dam by Birdcatcher.....	started 16, won 7	won £400 gr. Stakes.....	9	Vivid	Raydon, Ireland.....	G. Sturgeon.....	30 gr.
Victor	bay	5	by Chamblin, dam by The Saddler	started 21, won 1	won Cesarwick	untried.	The Pony	Raydon, Diss.....	R. Milton	5 gr., h. b. 4 gr.
Voltaire	chestnut	11	by Vindex, dam by Scroggins	started 11,	won Boy-Hit-Cup, Assol	1	Ossian	King's Norton, Epsom.	Mr. A. Taylor ..	5 gr.
Voltaire	chestnut	17	by Surplice, out of Hybla, by The Provost ..	started 11, won 3	won the Derby	75	Suckstone	Middleton, York ..	Mr. R. Smallwood.	50 sovs. (30 mares)
Walkington	brown ..	7	by Andover, out of Martha Lynn, by Maitatis ..	started 17, won 2	won 170 h. at Thurst ..	untried.	---	Sterna, Driffield	Mr. W. Hayton ..	5 gr., h. b. 3 gr.
Warlock	roan ..	11	by Birdcatcher, out of Rebesah, by Pompey ..	started 19, won 6	won St. Leger.....	1	Roebuck	Paddock, Sheffield.....	Mr. Croft	15 gr. (30 mares)
Weatherbit	brown ..	22	by Sheet Anchor, out of Miss Letty, by Priam ..	started 8, won 3	won 4-year-old Stakes ..	57	Bedlam	Baby, Richmond	Mezra, Wetherby ..	50 gr. (12 mares)
Weatherden	brown ..	5	by Wetherbit, dam by Birdcatcher	started 6, won 1	Trial Sits, Nottingham	untried.	---	Hasteton, Woodbridge	---	5 gr., h. b. 2 gr.
Wild Dayrell	brown ..	12	by Ion, out of Ellen Middleton, by Bay Mid-	started 4, won 3	won the Derby.....	24	Buccamer	Chilton, Hungerford.	Mr. Rickaby	30 gr. (40 mares)
Wild Drake	bay	13	by Spry Jack, out of Decoy, by Filbo	Debutated 8	won Warwickshire Huns-	untried.	---	Old Warden, Biggles-	Mr. Morgan	5 gr., h. b. 2 gr.
Wild Hero (late Wild Deer)	brown ..	14	by Venison, out of Elizabeth, by Velocipede ..	never appeared ..	winner of several prizes for best hunters' stags.	1	Hero	Beverly	Erlington	5 gr., h. b. 2 gr.
Windhound.....	brown ..	17	by Pantaloon, out of Phrynos, by Touchstone ..	started 6, won 1	won £74 at Reading	29	Thornaby	Rawcliffe Paddock ..	Mr. T. Babson ..	10 gr.
Woolwich	chestnut	17	by Chadham, out of Clementine, by Acteon ..	started 46, won 16	won Ascot Cup	11	Greenwich Fair ..	Bawcliffe Paddock ..	Mr. T. Babson ..	5 gr., h. b. 3 gr.
Yellow Jack	chestnut	9	by Birdcatcher, out of Jamaica, by Liverpool ..	started 7, won 1	ran second 6 times	4	Gossamer colt ..	Newmarket	Mezra, Barrow ..	11 gr., h. b. 5 gr.
Young Melbourne	bay	11	by Melbourne, out of Clarissa, by Pantaloon ..	started 1	---	9	Rapid Rhone	Bawcliffe, York	Mr. T. Babson ..	Full.
Zurlet Zee	bay	10	by Orlando, out of Bacchella, by Sandbeck ..	started 26, won 10	won Chesterfield Cup ..	untried.	---	Cow Roast, Tring	Mr. Olver.....	13 gr.

The Groom's Fee, if not included, varies from a Guinea to Half-a-Crown.

THE METEOROLOGY OF MARCH.

The latter days of the February period, treated of in our last summary, were very cold, and the cold period had endured from the 17th day. The two days of February, namely, the 26th and 27th (commencing the period presently to be considered), form part of this cold series, and their mean values were defective, as compared with corresponding average values, by the respective amounts of 4.2° and 3° . The wind continued to blow from the N.E., and the barometer fell steadily. The small temperature changes which occurred on these days were remarkable, amounting on the 26th to $3\frac{1}{2}^{\circ}$ and on the 27th to $4\frac{1}{2}^{\circ}$. A slight change in the direction of the wind towards the S., which occurred on the 28th, produced an increase in atmospheric warmth, though not to any great amount. The mean value for the 28th exceeded its average by $2\frac{1}{2}^{\circ}$, and the values for the 29th of February and the 1st of March were the same as their averages. Rain fell on these latter days to the amount of 0.11 inch, and the atmosphere was nearly saturated with moisture. On the 1st of March the mercurial column reached a maximum height of 29.71 inches; it then turned, and decreased steadily for some days, reaching a value of 28.96 inches on the 6th, and the minimum value of 28.81 inches on the following day, and then fluctuated between this value and 29.10 inches till the 9th. As might have been expected with this great and constant depression of the atmospheric wave, many days of unsettled weather were experienced, and from the 3rd to the 11th rain fell on each day, with heavy snow on the 9th and hail on the 11th, to the collective amount of 2.08 inches, being at an average rate of a quarter of an inch per day. The heaviest falls were 0.62 inch on the 9th (rain and melted snow), 0.42 inch on the 6th, 0.32 inch on the 4th, and 0.2 inch on the 3rd and 8th. During this rainy period the wind blew from all quarters; but prevailed for the greater part of the time and with the greatest force from the S.W., blowing from that direction about half the whole period, and registering pressures of 8 lbs. on the 6th, 12 and 13 lbs. on the 7th, and 10 and 11 lbs. on the 11th. Singularly enough, the heavier falls of rain, namely, those of the 9th and 6th, which together make up half the total fall for this period, did not occur with this wind, but with winds from the N. and E.N.E., a remarkable and extremely interesting fact.

The mean temperature of four days with a prevalent S.W. wind was 45° , a value exceeding the corresponding average by about 5° , and during a portion of this period the easterly currents produced a deficiency of nearly 3° . The dampest days were also those on which easterly winds prevailed, the 3rd and 5th in particular closely approaching the point of saturation.

From the 11th to the 15th a short, warm, and cloudy period endured, within which is included the barometric maximum value for the month,

namely, 30.11 inches. The wind during this period blew briskly from the S.W., and the several amounts of excess of mean temperature values above corresponding averages were $8\frac{1}{2}^{\circ}$ on the 14th, nearly 4° on the 11th, 13th, and 15th, and $1\frac{1}{2}^{\circ}$ on the 12th. The highest temperature, on the 14th, was as high as 57° , and exceeded 50° on the other days of this period. From the 16th to the 26th, a very fine but generally cold period prevailed, accompanied throughout by winds from the E. or kindred quarters. The mean temperature on each day of this period fell below its average value, except on the 19th and 20th, which exceeded their respective averages by $1\frac{1}{2}^{\circ}$ and $2\frac{1}{2}^{\circ}$. The mean amount of deficiency for the whole period amounted to $1\frac{1}{2}^{\circ}$, and the greatest individual differences obtained were 3.4° on the 18th and 26th, 3.1° on the 24th, and 2.7° on the 25th. During this period several very fine days were experienced, the sky having been wholly free from cloud during four entire days, namely, the 16th, 18th, 20th, and 24th, and almost free from cloud on the 12th and 19th. The cloudless state of the sky both by day night induced great extremes of temperature, and we find that on the clear or nearly clear days great ranges of temperature were experienced; for example, on the 19th, the range of temperature amounted to 23° , on the 20th to 26° , and on the 24th to 26° . But the ranges of temperature on the 22nd and 26th amounted only to 7° and 9° respectively. It may be well to mention that during this long period rain fell only on two days, and then only to the slight amount of 0.10 inches.

Casting a glance over the tables of results, we find that the highest barometer reading occurred on the 13th, and was 30.11 inches; the lowest was 28.81 inches on the 7th, giving a range for the month of 1.30 inch. The highest temperature in the shade was 58.0° , on the 4th, and the lowest 26.9° , on the 24th, and the absolute range amounted to 31.1° . The highest reading in the rays of the sun was 93.4° , on the 24th, and the lowest on the grass was 19.6° , on the 25th. The dampest days in the month were the 3rd and 5th, when the atmosphere was nearly saturated with moisture; the driest days were the 12th and 17th. The total amount of rain collected between February 26th and March 26th amounted to 2.39 inches; a somewhat large amount. The number of days on which a measurable amount of rain fell amounted to 13. The past month therefore has been remarkable, firstly, for the great quantity of rain which fell during one period; secondly, for the long period of fine spring-like weather; and, thirdly, for the great prevalence of winds from the east or some one of its kindred directions. The long period of bright, dry, sunny weather following immediately upon the heavy rains, has already proved, and will hereafter prove, of almost incalculable value to the growing crops.

METEOROLOGICAL ELEMENTS FOR THE NEIGHBOURHOOD OF LONDON;

FROM FEBRUARY 26TH TO MARCH 26TH, 1864.

Month and Day.	Temperature of the Air in Shade.			Highest Reading of a Thermometer in the full Rays of the Sun.	Temperature of Vegetation.*	Degree of Humidity. (Saturation=100).	Amount of Cloud, 0 to 10.	Amount of Rain.	General Direction of the Wind.	Weather Remarks.
	Highest	Lowest	Mean.							
1864.	°	°	°	°	°			Inches.		
Feb. 26	37.3	33.7	35.5	40.5	30.9	93	10.0	0.00	N.E.	Overcast; a little rain
27	39.0	34.7	36.8	43.3	34.2	98	10.0	0.00	E.N.E.	Overcast; a little fine rain
28	50.0	37.1	42.3	50.0	33.3	96	6.7	0.00	E., S.E.	Overcast; clear night; rain
29	43.3	36.9	40.0	49.1	30.0	98	8.0	0.08	S.E.	Overcast day; clear night
Mar. 1	50.6	29.4	40.1	75.4	24.2	96	7.0	0.03	S.E.	Cloudy; occasional rain
2	48.2	29.8	36.7	60.0	24.6	95	9.5	0.00	S.E., N.E.	Overcast; foggy morning
3	41.8	35.2	38.0	52.3	35.2	99	10.0	0.21	E.	Overcast; rain generally
4	58.0	40.6	47.7	88.0	39.0	89	8.5	0.32	S.W.	Variable; rainy morning
5	46.2	38.9	41.5	51.0	33.6	99	10.0	0.01	E.N.E.	Overcast; thin rain
6	53.6	39.0	45.1	85.2	38.5	90	8.3	0.42	E.N.E.	Morn. heavy rain; var. day
7	52.0	42.9	46.1	76.0	41.3	79	8.8	0.09	S.W.	Generally cloudy; rain
8	48.5	38.0	41.7	62.0	37.8	93	10.0	0.19	variable	Overcast; showers of rain
9	38.7	32.2	33.8	41.4	29.4	92	10.0	0.62	N.	Overcast; rain and snow
10	46.3	27.9	37.0	68.5	26.2	86	3.8	0.11	NW., SW.	Variable; occasional rain
11	52.1	39.5	44.8	80.0	31.3	78	5.3	0.11	S.W.	Rain & hail morn; rny. night
12	50.3	35.3	42.3	79.4	31.4	69	3.0	0.00	W.S.W.	Fine; light clouds
13	51.3	35.2	44.8	80.0	29.5	80	7.3	0.00	S.W.	Fine; cloudy
14	57.2	44.4	49.5	83.7	38.7	72	10.0	0.00	S.W.	Generally cloudy
15	52.6	39.0	45.4	55.7	37.0	86	10.0	0.06	W.S.W.	Overcast; rain; gloomy
16	48.2	33.6	40.2	82.2	30.4	70	0.0	0.00	N.E.	Cloudless; very fine day
17	49.8	31.7	39.7	82.2	25.5	69	6.5	0.00	S.E.	Partially cloudy
18	47.1	29.9	38.4	82.7	21.1	76	0.0	0.00	E.	Very fine; cloudless
19	55.1	32.1	43.2	86.3	27.3	81	1.3	0.00	E.	Fine; few clouds
20	57.6	31.3	44.5	91.0	21.7	84	0.0	0.00	E.N.E.	Very fine; cloudless
21	49.0	34.4	40.0	87.0	29.5	88	8.0	0.00	N. E.	Generally cloudy
22	44.5	37.5	40.5	54.7	35.8	81	10.0	0.00	N.E.	Overcast
23	49.1	34.0	40.1	84.6	33.0	73	4.3	0.00	N.E.	Cloudy morning; then clear
24	52.5	26.9	39.0	93.4	26.9	78	0.0	0.00	E.	Very fine; hazy morning
25	52.3	27.8	39.5	88.0	19.6	89	6.7	0.00	N., S.W.	Cloudy, with haze and fog
26	44.3	35.1	38.9	54.7	28.3	82	10.0	0.04	N.N.W.	Overcast; a little rain

* The "temperature of vegetation" is that obtained from a self-registering thermometer placed on the grass at night. It is therefore a minimum reading for the previous twenty-four hours.

TABLE SHOWING THE PRINCIPAL FLUCTUATIONS IN THE ATMOSPHERIC WAVE, FROM FEBRUARY 26TH TO MARCH 26TH, 1864.

1864.		Reading of Barometer.*		1864.		Reading of Barometer.*	
Month, Day, and Hour.	Highest.	Lowest.	Month, Day, and Hour.	Highest.	Lowest.		
	Inches.	Inches.		Inches.	Inches.		
Feb. 26, 9 a.m. ..	29.81		Mar. 9, 9 a.m. ..		28.94		
" 29, 3 p.m. ..		29.47	" 10, noon ..	29.56			
Mar. 1, 9 p.m. ..	29.71		" 11, 3 p.m. ..		29.38		
" 6, 10 a.m. ..		28.96	" 13, 10 a.m. ..	30.11			
" 6, 1 p.m. ..	29.00		" 15, 3 p.m. ..		29.67		
" 7, 9 a.m. ..		28.81	" 16, 9 p.m. ..	30.05			
" 7, 9 p.m. ..	29.07		" 20, noon ..		29.47		
" 8, 9 a.m. ..		28.87	" 24, 9 a.m. ..	29.88			
" 8, 9 p.m. ..	29.10		" 26, 3 p.m. ..		29.39		

* All the readings are reduced to the constant temperature of 82 degs.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The first fortnight of March was anything but reasonable, there being much sleet and rain, with a greatly raised temperature now and then. Thus the opening of spring began to be despaired of; but a complete change suddenly ensued, and lasted, almost without interruption, throughout the remaining half of the month. Fine wind and bright suns followed the inauspicious commencement. The land was promptly brought into order, and the sowing of all sorts of Lent corn proceeded with in earnest. In some of the light soils beans and peas had been commenced previously, but with the close of this month most of the barley has been well got in. Winter beans, it seems, have suffered fatally by the extreme fluctuations, and other crops have been substituted; but wheat has held out well, with very few exceptions. So the present spring has commenced with the fairest prospects. Business has, however, remained excessively heavy, the condition of samples having been much deteriorated by the prevalence of wet and foggy weather; and though some amendment is now apparent, there has not been sufficient time to make a very marked difference. Prices, too, have still been languishing. The course of the averages shows a decline of 9d. per qr. in the month, commencing at 40s. 6d., and descending to 39s. 9d., which is now 1d. below the lowest point of the year 1863. Whether this low range is to be passed ere long, seems entirely to depend on the probabilities of war. Prussia and Austria have been mad enough to rush to the inglorious strife, and upon their retirement no further embroilment may ensue. The proposed Conference may have this result, and peace be preserved for England and other countries not yet engaged; but the issue of the contest is doubtful enough to warrant those who can hold for better prices, to do so. It is already to be noted that since the requirements for Christmas rents, the weekly sales are somewhat reduced, and the unremunerative character of foreign imports has had a like effect upon foreign supplies; and though the re-opening of the Baltic would naturally have brought a large increase, the Danish blockade greatly interferes with commerce, and freights for neutral vessels have been sent up to 5s. 3d. per qr.; a rate sufficiently discouraging to importers, and in many cases quite a prohibition. The war, too, in America goes on with a corresponding waste and abstraction of labour; and though the cotton famine seems in process of extinction by the efforts of India, there has been no such premium on corn as a double price, to stimulate its growth in strange places. Last year's supply is nearly the exclusive stock that the world holds, and there may be even worse calamities than war to exhaust our stocks or call for a more careful use. High prices under present circumstances are not to be thought of, but rates are now so much below an average that an advance of 10s. might be gained, with the least excitement, or any justifiable complaints on the part of con-

sumers. The following prices have been current recently in the several places named. The best native white wheat in Paris was worth 43s., red American at Antwerp 45s., native Louvain 6d. per qr. more.; high-mixed Danzig at Amsterdam 51s., Friesland white 42s., Saale and Mark red at Hamburg 40s. to 41s., good high-mixed at Konigsberg 38s., red at Stettin 37s., mixed new wheat at Danzig from 36s. to 42s.; extra old was very scarce, and held at 48s. Wheat at Cologne, of home growth, 40s. 6d.; Bavarian at Straubing the same. The best native at Venice was selling at 47s. 6d., there being wants to supply in Lombardy. Soft red at Algiers was quoted as high as 47s. At New York, with ever-varying exchanges, prices were unreliable; but the last were about as follows: Chicago red 32s. 6d., winter red 34s. 6d., white to 38s.—all per qr. of 480lbs.

The first Monday in Mark Lane opened on very small supplies, both English and foreign. During the morning rather more was exhibited on the Kentish stands than of late, but little appeared on those of Essex. The condition was bad, with few exceptions, and the demand extremely limited. It was late in the day before a sale was made, and then only the best went off, and that at a decline of 1s. per qr. on the previous currency. The transactions in foreign samples were chiefly in old qualities for mixing, and the retail demand thus experienced was at former prices. In floating cargoes very little was done, but holders were asking the same money. There was less dulness this week in the country than in London, still it was the prevailing feature of the trade. Worksop, Rugby, and a few other places, noted the decline of Mark Lane. Gloucester was rather in buyers' favour. Hull, Leeds, Birmingham, and Bristol only noted slow sales. Liverpool was 2d. per cental cheaper for red wheat on Tuesday, without subsequent change. Edinburgh and Glasgow followed the town advices, and were 1s. per qr. lower. Dublin was wholly without business.

The second Monday has a short English, but liberal foreign supply, the contributions being chiefly from Danzig and New York. Very few fresh samples appeared this morning on the English stands; still only a portion was cleared, and that with difficulty, at the previous rates. The want of condition in home-grown samples brought on more inquiry for dry old foreign, which fully realized the previous quotations. Floating cargoes, though not numerous, were little inquired for. Quietness was the order of this week throughout the country. Fine weather had apparently set in, which was most ardently desired, both for spring planting and the condition of samples. Some places, however, rather hardened on the arrival of fair weather, from the improved prospects; others remained dull, bringing accounts to a pretty equal balance. Among the more cheerful reports were those of Birmingham, Newark, Worksop, and

Rochester. Liverpool kept steady through the week. Edinburgh and Glasgow were in calm, without change of values. The Irish markets generally about the same, with more doing at Dublin.

The third Monday had a small English and very moderate foreign supply. Not much was then offering from Essex or Kent; and with some improvement in the condition from the fine winds, sales were more readily made. New foreign being in worse condition generally than English, was quite neglected, but dry parcels found a steady inquiry at fully as much money. No change was noted in the value of floating cargoes. This being holiday week, there was very little stirring in the country markets; some of them, however, with better samples offering, evinced more confidence. The only market at Liverpool was unaltered, as were most of those from Scotland and Ireland.

The fourth Monday, with moderate arrivals of both English and foreign, was almost a holiday market. The most wheat exhibited this morning was from Kent, and that was but little, with still less from Essex. Business did not open till late, and then the best samples went off quietly at the previous quotations. The same slow demand, originating in necessity, characterised the foreign trade, there being not the slightest change of value in any description offering for sale.

The imports into London for four weeks were 16,805 qrs. English, 40,026 qrs. foreign; against 18,512 qrs. English, 78,915 qrs. foreign for the same period in 1863. The foreign imports for four weeks to 19th March were 362,546 qrs. wheat, 593,569 cwt. flour.

The flour trade throughout the month has been of quite a monotonous character. Pressure on the part of holders, either of country-made samples or foreign, invariably produced lower rates; but these sales having but a transient influence, we can note no change of values throughout the entire month. Norfolks must have been good to bring 30s. per sack; American ranged from 20s. to 25s. per brl., French 33s. to 34s. per sack, and town rates have stood with 40s. as the highest quotation. The imports from abroad have been moderate, and good barrels remain scarce. The arrivals into London during the four weeks were 56,298 sacks country made, 3,551 sacks 16,250 brls. foreign; against 58,874 sacks country, 4,126 sacks 72,485 barrels foreign in 1863.

Barley, with but slender arrivals, has been a very heavy trade, prices tending downwards; but for really good making sorts the decline has not exceeded 1s. per qr. Medium sorts, both English and foreign, have been of irregular value, and scarcely so dear relatively as low grinding; indeed 53 lbs. Danish kilndried has been offering at 23s. 6d. per qr., and 50 lbs. per bushel almost includes every sort of that weight at 22s. per qr., while some parcels have been sold at less. The low price of oats, as well as of beans, have both served to keep down this grain, in consequence of the last year's abundant crop; but we think the point of depression is about marked, and in the summer months sales will be made in retail for more money. The imports into London for four weeks were

in English 15,348 qrs., foreign 23,931 qrs.; against 13,875 qrs. English, 83,537 qrs. foreign in 1863.

Malt has also been very dull all through the month, and the best qualities have given way fully 1s. per qr.

The oat trade has been relatively more depressed than any other, but the better supplies from Scotland and Ireland seem to have had greater influence than foreign arrivals, for, with the exception of the last week, when they were at the highest, prices regularly went down 6d. per qr.—say in all 1s. 6d. per qr.—so that 40 lbs. per bushel oats have been selling at 18s. per qr., a circumstance that has not occurred for some time. True, there is a good crop here, an improved yield in the other parts of the empire, and plenty in Denmark and Sweden, as well as Russia, but will the latter be certain to arrive in the midst of conflicts, and with rising freights? And what temptation will there be in present rates? We, in fact, are strongly of opinion that this grain, though it has grounded, will shortly be got off again, and sell more briskly. The imports into London for four weeks were in English 18,939 qrs., Scotch 18,449 qrs., Irish 15,501 qrs., foreign 91,663 qrs.; against 20,121 qrs. English, 285 qrs. Scotch, 1,900 qrs. Irish, 179,028 qrs. foreign for the same period in 1863.

Beans on the second Monday yielded 1s. per qr. on former rates, but this is all the reduction they have sustained, having long been much depressed, so that masagans have not been worth over 29s. per qr. The quality being good this year and heavy, they come favourably into competition with Egyptian, which have been held at 31s., and as no heavy arrivals are coming from Alexandria, it is not to be expected that, when hardened by the March winds, they will continue to go a begging—27s. is quoted even at Algiers. The imports into London during four weeks were 4,440 qrs. English and 4,073 qrs. foreign, against 1,954 qrs. English and 4,444 qrs. foreign last year; showing that the English receipts, in consequence of the goodness of the crops, have more than doubled.

Without a steady continuance of frosty weather to occasion a demand for boiling peas, the demand has very much dwindled; and though the entire supplies, both for boiling and hog feed, have been scanty, the price of beans and barley has come into heavy competition with this grain. Fair boiling sorts of foreign may now be had for 35s. per qr., blues being turned away from the seedman's premises, from the quantity grown having been placed alongside with common duns, and been selling under 30s. per qr.; yet stocks of foreign, altogether, are but limited. The imports into London for the month were 998 qrs. English and 363 qrs. foreign, against 291 qrs. English and 4,097 qrs. foreign for the same time in 1863.

Linseed has been in increased supply; but such has been the demand, and so limited the stocks on hand, that rates still keep at a high range, and have undergone no reduction. Cakes have found a fair sale at the previous values.

If the corn trade has been dull, that in seeds, which ought to be in full season, has been seriously worse. It would seem that, in spite of the low

rates asked for foreign red cloverseed, there is enough low English in farmers' hands for their own use, while they have been turning the bright purple seed at high prices into money. Trefoil, too, has been very slack, with a poor crop; and white cloverseed has been little in request. Tares have been unusually neglected; small offering in vain at the feeding price, 30s. per qr., large at 40s. Canary has scarcely maintained the late advance. Other seeds much as last quoted.

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.
Feb. 13, 1864....	40	8	31	11	19	1	29	1	33	7	33	7
Feb. 20, 1864....	41	1	32	0	19	8	28	10	33	2	32	5
Feb. 27, 1864....	40	6	32	0	19	4	39	0	33	1	32	9
March 5, 1864....	40	2	31	6	19	10	28	6	33	5	32	10
March 12, 1864....	40	1	31	5	19	8	29	2	32	7	33	0
March 19, 1864....	39	9	31	4	19	3	32	4	32	10	32	11
Aggregate Average	40	5	31	8	19	6	31	2	33	1	32	11
Same time last year	46	1	36	6	21	8	33	6	36	2	36	9

COMPARATIVE AVERAGES—1864-63.

From last Friday's Gaz.	s. d.	From Gazette of 1863.	s. d.
Wheat.....	39 9	Wheat.....	45 0
Barley.....	31 4	Barley.....	35 9
Oats.....	19 2	Oats.....	21 6
Rye.....	32 4	Rye.....	35 1
Beans.....	32 10	Beans.....	35 7
Peas.....	32 10	Peas.....	34 6

PRICES OF SEEDS.

BRITISH SEEDS.	
MUSTARD, per bush., white	9s. 6d. to 10s.
CORIANDEE, per cwt.	14s. 16s.
CANARY, per qr.	56s. 64s.
TARES, winter, new, per bushel.	6s. 6s. 6d.
TREFOIL.....	24s. 27s.
LINSEED, per qr., sowing—s. to 72s.	crushing 58s. 64s.
LINSEED CAKES, per ton.	£9 10s. to £10 10s.
RAPESEED, per qr.	62s. to 65s.
RAPE CAKE, per ton.	£5 10s. to £6 0s.

FOREIGN SEEDS.

CORIANDEE, per cwt.	16s. 18s.
CARRAWAY "	—s. —s.
TREFOIL.....	22s. 24s.
CLOVERSEED, red 44s. to 50s., white	50s. to 60s.
LINSEED, per qr., Baltic 58s. to 60s.	Bombay 68s. —s.
HEMPSEED, small —s. per qr., Dutch.	—s. 42s.
LINSEED CAKE, per ton.	£9 10s. to £11 0s.
RAPESEED, Dutch	—s. to —s.
RAPE CAKE, per ton.	£5 0s. to £6 0s.

HOP MARKET.

BOROUGH, MONDAY, March 28.—There is no alteration in the hop market since our last.

Mid and East Kents.....	120s., 140s., 180s
Weald of Kents.....	115s., 130s., 145s.
Sussex.....	105s., 120s., 130s.
Bavarians.....	105s., 135s., 168s.
Belians.....	80s., 84s., 95s.
Americans.....	105s., 120s., 132s.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, MONDAY, March 28.—During the past week the arrivals coastwise have been good, and very large, by rail, and the prices of the former week have been barely maintained. The following are this day's quotations:—

Yorkshire Flukes.....	per ton 70s. to 90s.
" Regents.....	50s. to 70s.
" Rocks.....	45s. to 50s.
Dunbar Regents.....	65s. to 75s.
Kent and Essex Regents.....	50s. to 70s.
North Berwick Regents.....	50s. to 60s.
Perth, Forfar, and Fifeshire Regents.....	45s. to 50s.
" " Rocks.....	45s.

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, March 28.—Large supplies of Potatoes continue on sale here: generally speaking the trade is

dull, yet prices are without material change from our last report.

Kent and Essex Regents ..	60s. to 80s. per ton.
Yorkshire Regents.....	45s. to 70s. "
Ditto Rocks.....	40s. to 55s. "
Ditto Flukes.....	80s. to 95s. "
Scotch Regents.....	45s. to 70s. "
Ditto Rocks.....	40s. to 55s. "
Seedlings.....	50s. to 65s. "

PRICES OF BUTTER, CHEESE, HAMS, &c.

BUTTER, per cwt.—	s.	d.	CHEESE, new, per cwt.—	s.	d.
Friesland.....	116	118	Cheddar.....	60	74
Dorset, new.....	124	116	Double Gloucester.....	60	68
Carlow.....	—	—	Cheddar.....	64	78
Waterford.....	—	—	American.....	64	84
Cork.....	—	—	HAMS: York, new.....	56	64
Limerick.....	—	—	" Cumberland.....	56	68
Sligo.....	—	—	" Irish, new.....	56	68
FRASH, per doz. 11s. 6d. to 15s. 6d.	—	—	BACON: Wiltshire, dried.....	64	68
			" Irish, green.....	64	68

WOOL MARKETS.

ENGLISH WOOL MARKET.

CITY, MONDAY, March 28.—Our market continues to be well supplied with nearly all kinds of wool. Although the demand for export purposes has not increased, prices, under the influence of a healthy home trade, are readily supported. The colonial wool sales have passed off extremely well.

CURRENT PRICES OF ENGLISH WOOL.	s.	d.	Per lb.
Fleeces.—Southdown hoggets.....	1	9	1 10
Half-bred ditto.....	1	11 1/2	9 0
Kent fleeces.....	1	11	1 11 1/2
Southern ewes and wethers.....	1	8	1 9
Lelcester ditto.....	1	9 1/2	1 10 1/2
Sorts.—Clothing.....	1	6	1 10
Combing.....	1	5 1/2	1 11 1/2

LEEDS (ENGLISH AND FOREIGN) WOOL MARKET, (Friday last.)—There continues an undiminished consumption of English wool, and prices of some sorts get rather higher. Colonial Wool is in fair request, and prices may now be considered as re-established at rates higher than have prevailed for some time.

BRADFORD WOOL MARKET, (Thursday last.)—We have again experienced a very brisk demand for all deep-grown wools, with prices full firmer than last week. For Lincoln and half-bred hoggs 2s. 6d. to 2s. 7d. per lb. is obtained without great difficulty. Some holders are careless to sell even at this figure, and look forward to obtain some advances on these extreme rates. Down wools are still somewhat neglected, and do not advance in proportion.

MANURES.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano, direct from the importers' stores, or ex ship (34 tons)	£12 5s. to £12 10s. per ton.
Bones, 45; crushed, 45 10s. per ton.	
Animal Charcoal, 70 per cent. Phosphate) 25s. per ton.	
Coprolite, Cambridge, (in London) whole 42 5s. to 43 5s., ground 41 to 43 5s.; Suffolk, whole 41 10s. to 42, ground 42 10s. to 43 10s. per ton.	
Nitrate of Soda, 17s. per cwt.	
Sulphate of Ammonia, 41 10s. to 42 10s. per ton.	
Gypsum, 30s. per ton. Superphosphate of Lime, 42 to 45 5s. p. ton.	
Sulphuric Acid, concentrated—184 1/2 per lb., brown—171 1/2 1/2.	
Blood Manure, 45 5s. per ton. Dissolved Bones, 45 10s. per ton.	
Linseed Cakes, best American, 41 10s. per ton, ditto 41 10 to 42 10s. per ton; English 41 10s. per ton. Rape Cakes, 45 10s. per ton.	
Cottonseed Cake, 45 10s. to 46 per ton.	

E. PURSER, London Manure Company, 116, Fenchurch Street, E.C.

LIVERPOOL SEED AND GUANO, &c., MARKET.

Guano, Peruvian £12 7 6 to £20 0 0	Linseed Cake, per ton
Do. Upper do 5 12 6 6 0 0	Americ., this, 22 17 (last 7 4)
Patagonian 8 0 0 0 0 0	Do. in Brils. 0 0 0 0 0
Kooria Kooria. 3 10 0 0 0 0	English..... 0 0 0 0 0
Bone Ash 4 10 0 4 15 0	Canada Cakes, account 7 0 0 7 10 0
Baltport, Bengal, 3 per cent. 0 0 0 0 0 0	Brimstone, 2d & 3d 8 0 0 8 0 0
Cloverseed, new red, per cwt. 1 18 0 2 8 0	Nitr. of Soda, p. ct. 3 15 0 3 15 0
	" Linn. Bombay, p. ct. 3 15 0 3 15 0
	" Tallow, 1st F.Y.C. 2 3 0 2 3 0

SAMUEL DOWNES and Co., General Brokers, Exchange Court, Liverpool.

Agricultural Chemical Works, 8, Storemarket, 6, South.	
Prentice's Cereal Manure for Corn Crops.....	per ton £2 10 0
Mangold Manure.....	" " 2 10 0
Prentice's Turnip Manure.....	" " 6 10 0
Prentice's Superphosphate of Lime.....	" " 6 10 0

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Southdown Ewes

The property of the Duke of Devonshire, bred at the Devonshire House, London, in 1817.



E. Haber.

E. Haber.

A good show.

PLATE III.

SOUTHDOWN WETHERS.

THE PROPERTY OF THE DUKE OF RICHMOND, OF GOODWOOD.

These wethers, to use the words of our own report, "fairly beat Lord Walsingham" in the old class at the last Christmas Show of the Smithfield Club, and consequently took the first premium of £20, with the silver medal to the Duke as their breeder. This is some very satisfactory proof that the Goodwood flock has lost nothing of its excellence since the President of the Club died; and,

indeed, we believe that both the present Duke and Duchess of Richmond take as much interest in the Southdowns as ever did the lamented nobleman, whose pride it was to bring them to so much excellence. The old battle, however, of Goodwood against Hove cannot be renewed for some time to come, as Mr. Rigden has to serve out his term as a Steward of the Club.

PLATE IV.

A GOOD "SHOW."

There is a deal of art in showing a horse, whether we follow the refined Mr. Rice down Piccadilly, handling an awkward-mouthed one as if they were the best friends in the world, and never for a moment hazarding the balance of his well-set hat, or "the nice conduct of his clouded cane." Or, watch the Yorkshireman from the rope-side as he gives the high-stepping trotter lots of line, and spins him round the ring for the especial edification of the judges. Or, hearken to the voice of the charmer, as he warms up to his wares like another Cheap Jack, and points the character of the old bloody chesnut, with a *crack* of the whip for every epithet, and an occasional oath or two for Jabez to send him along! Talk of Howden or Horncastle, where Mr. Quartermaine will take a three-hundred-guinea nag with just a word and a look! commend us to Barnet or Stokenchurch, where the several parties to a contract will wrangle, and part, and come together again, and

drink, and do everything but fight, if not that, before they finally shake hands over a deal, the main conditions of which stipulate that farmer Broadbeans is to have the white-legged gelding for seven pounds fifteen shillings and sixpence, and that Gipsy Jack is to be thrown half-a-crown back, and stand a gallon of beer amongst their mutual friends and acquaintance.

Where you ever at Stoken-church Fair, my friend? You have been through the village, of course, after surmounting that long pull up Dashwood hill, and dipping again into the valley on your way to Oxford, with steady old Charley Holmes, dashing Dick Snowden, handsome Jack Bramble, or knowing George Tollit, to take you along, and advise you as to your proper line as a gownsman and a gentleman. But did you ever try back, to study the fair, as it is, or at any rate was, some twenty years or more since, the great Gipsy Mart of the Kingdom:

"The wrinkled grandam there you may espy,
The ripe young maiden with her glossy eye;
Men in their prime—the striplings dark and dun,
Scathed by the storms, and freckled by the sun."

Every family with a horse of some sort to sell, and a fortune of some kind to tell; the maidens attired in the most catching, but at the same time most picturesque of colours, and the lads even got up as gaily in their way, and so different in their costume from the slang fustian of the conventional rough-rider. Mark Jabez, there, as he sits well back on the varmint old screw, with his raven locks flying, his dark eye flashing, his fancy fogle all sprigs and ends floating in the wind, his bright scarlet waistcoat as gracefully dishevelled, his green-plush breeches as carelessly adjusted, and his royal-purple hose seeking yet closer company with his armèd heel. The tight-trowsered, stiff-necked generation that haunt Hyde Park Corner in the one "season" and the Shires in the other, would fall back aghast at such an apparition—or ten to one that he went over them. But Jabez can ride, too, with nerve, hands, and a seat that scorns a saddle even on the most razor-backed Rosinante that ever was trotted out. He is up in a moment, and threading his way through the fair—

at some slight risk of life, no doubt; but there is the chance of a customer, as the yeoman asks to see the chesnut out, and old Jordan turns his eye on him, when Jabez sets the screw agoing. The gift of prophecy, moreover, is as strong in the hedge-side dealer himself as in his comeliest daughter, who is only waiting till her father has quite done with you to take her tithe of the fairings. "Now, then, Squire, say the word, and at ten guineas he is yourn. He'll take you and the Missus to market a Saturday, to church a Sunday, and to the badger-bait a Monday. He'll jump any fence you've got on your farm, and trot twenty miles an hour, if you only like to let him. He would have won the Derby if they hadn't got at him, and he'll win every race you like to run him for at Marlow in the week arter this. Come, now, bisness is bisness; give us your hand at nine-punten and he is yourn. There! that'll do, Jabez! If the genelman don't want him we'll keep him for the Prince of Wales or the Emperor of the French. Still, I don't like leaving a friend, and another half-sovereign shan't part us—or, daug my eyes, Squire, what will you give for him? Only don't say it all at once!"

THE MANURE FROM COVERED AND UNCOVERED YARDS.

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

Two prize essays on farm-yard manure, in the present volume of the *Highland Society's Transactions*, will well repay the young farmer for a careful perusal. Some years have now elapsed since the greatly superior value of farm compost prepared in covered buildings was shown by Lord Kinnaird and other agriculturists. This important fact was subsequently supported by various chemical investigations, and now we have the same conclusions verified in the prize essays to which I have referred. The detail is in these given with all that careful attention to the economical portion of the inquiry which commonly, so much enhances the value of the reports in our great northern society's *Transactions*. This portion of the investigation, in truth, is, like most other agricultural questions, almost the only valuable section of the inquiry; for no one with whom we have to engage in the case before us will doubt that to prepare our farm-yard manure in open yards is, of necessity, to expose it to the injurious influence of the rain and snow. It is not, however, so well known how very considerable is that ill effect of those down-pourings on the farm-yard manure. It will not therefore be an unprofitable research if we briefly endeavour to calculate the amount of water which annually falls on a farm-yard, and moreover ascertain what portion of that rain evaporates from it, and what amount filters or drains away, carrying with it to a large extent the soluble or most valuable portion of the dung. The amount of this, of course, varies with the annual rainfall in different portions of our island. This will range from about 2.100 tons of water per acre in Essex,

Suffolk, and Bedfordshire, to 3,600 or 4,500 tons in Lancashire, Westmoreland, and Devonshire. (An inch of rain is about equal to 100 tons of water per acre). Now, supposing that the farm-yard covers an acre only of ground, how is the amount of water which falls upon that space appropriated—what drains away—what amount evaporates? This question was some years since carefully examined on the chalk formation by Mr. J. Dickenson, of King's Langley, in Hertfordshire. He has given the average depth in inches of rain—the proportion of this which filtered or drained away, and the proportion which evaporated, in the eight years from 1836 to 1843 inclusive (*Jour. Roy. Agri. Soc.*, vol. v., p. 150). It is as follows:

	Rain.	Flt.	Evap.
January	1.847	1.807	0.540
February.....	1.971	1.547	0.424
March.....	1.617	1.077	0.540
April	1.456	0.806	1.150
May.....	1.856	0.108	1.748
June.....	2.213	0.039	2.174
July.....	2.287	0.042	2.245
August.....	2.427	0.036	2.391
September	2.639	0.369	2.270
October	2.823	1.400	1.423
November	3.837	3.258	0.578
December.....	1.841	1.806	0.154

Mean..... 26.614 .. 11.294 .. 15.320

He further examined the weight in tons of rain per acre,

which during those eight years fell in the summer and winter half-years. The results he obtained were as follows, in the summer half-year, April to September inclusive:

Years.	Rain. Inches.	Filt. In tons weight per acre.	Evap. 1023
1836	12.20	212	1023
1837	9.80	10	982
1838	10.81	12	1082
1839	17.41	263	1500
1840	9.68	—	900
1841	15.28	—	1545
1842	12.15	131	1099
1843	14.04	100	1322
Average.. 12.67		91	1192

It will be seen from this table how largely during the summer half of the year the evaporation from the farm-yard exceeds the drainage portion. When, however, we are in the winter half of the year a very opposite result is obtained; for now the portion of rain-water which filters or drains away is far greater than that which rises in vapour. Mr. Dickenson's winter observations gave the following results, October to March inclusive:

Years.	Rain. Inches.	Filt. In tons weight per acre.	Evap. 330
1836	18.80	1574	330
1837	11.30	693	452
1838	12.32	855	393
1839	13.87	1248	569
1840	11.76	829	182
1841	16.84	1437	269
1842	14.28	1089	387
1843	12.43	720	538
Average.. 13.95		1052	360

If then, we conclude that about two-fifths of all the rain-water filters or drains away from the homestead, this is equal to an annual drain of, say from 1150 tons per acre in Hertfordshire to about 2700 tons from the same extent of land in the moister side of our country.

Now what does this large amount of water probably dissolve in its passages through the manure of the farm-yard? This inquiry has, to a considerable extent, been answered by the researches of two eminent chemists, who examined the drainage from a farm-yard and the liquid from a dung heap.

The drainage from fresh farmyard manure was found by Professor Voëcker (*ibid*, vol. xviii., p. 137) to contain in grains, per gallon:

Ammonia	15.13
Organic matter	716.81
Ash	628.80
Total per gallon	1357.74
Containing nitrogen	81.08
Equal to ammonia	37.78

The 625.80 ash consisted of:

Silica	9.51
Phosphates of lime and iron	72.65
Carbonate of lime	59.58
Sulphate of lime	14.27
Carbonate of magnesia	9.95
Carbonate of potash	297.38
Chloride of potassium	60.64
Common salt	101.82

Professor J. F. Johnston (*Trans. High. Soc.*, 1846, p. 187) examined the drainage of farmyard dung of a stronger kind than that usually met with. He found that an imperial gallon of the drainage from some heaps of cow-dung exposed to rain contained an ounce of dry solid matter, or

	Grains.
Ammonia	9.6
Organic matter	200.8
Inorganic matter (ash)	268.8

The 268.8 grains of inorganic matters consisted of:

	Grains.
Alkaline salts	207.8
Phosphate of lime and magnesia, with a little phosphate of iron	25.1
Carbonate of lime (chalk)	18.2
Carbonate of magnesia, and loss	4.8
Silica, and a little alumina	13.4

An imperial gallon of the drainage from farmyard dung, when watered with cows' urine, contained 617½ grains of dry matter, consisting of:

	Grains.
Ammonia	21.5
Organic matter	77.6
Inorganic matter, or ash	518.4

It is only possible to give an approximate estimate of the amount of all the soluble and other matters removed in the drainage from a farmyard; but, supposing that the liquid thus wasted is of the average strength of that examined by Prof. Voëcker, which contained 1357.74 grains per gallon of solid matters, every ton of drainage water would contain about 45lbs. Then if we find, with Mr. Dickenson, that 1,143 tons of rain-water per acre annually filter away, then about 10 tons of the most valuable portion of the dung is during the year thus removed from a yard of that extent. And this calculation does not include the loss sustained by exposing the manure to the direct action of the sun and winds.

It is, then, pretty evident, from these results, that the manure prepared in covered places ought to be different in its composition and richer in soluble matters than that prepared under otherwise similar circumstances, exposed to the rain. Some carefully-conducted chemical investigations by Mr. Way, on the manure produced in the cattle-boxes and open yard of Mr. C. Lawrence, of Cirencester, has shown this to be the case. He gave some time since the result of these examinations, in the following tabular form (*Jour. Roy. Ag. Soc.*, vol. xviii., p. 368). In 100 parts of each manure were found:

	Box.	Farm-yard.
Water, per cent.	71.40	71.00
100 parts, dried at 75 to 80 deg. of Fahr., gave of—		
Ammonia	2.37	1.70
Matters soluble in water, organic and inorganic	10.70	4.60
Which left, on incineration, a fixed residue of	4.28	2.78

This fixed residue consisted of

	Net determined
Silica	0.30
Phosphoric acid	0.36
Alkalies, potash, and soda	2.00

For the sake of showing at a glance the difference between the two manures, the results are given under another arrangement, as follows:

	Box.	Farm-yard.
Water, per cent.	71.40	71.00
100 parts, dried at 75 to 80 deg. Fahr.:		
Nitrogen equivalent to ammonia	2.37	1.70
Organic matter removable by water	6.42	1.82
Inorganic ditto, consisting of		
Phosphoric acid	0.30	0.28
Alkalies	2.00	0.80

We should be prepared to expect from these chemical examinations, that the effect of these manures, when employed on the land, would be marked by a considerable difference. From the result of the trials of Mr. B. S. Skirving, of Camp Town, in East Lothian, given in his prize report (*Trans. High. Soc.*, 1864, p. 210) we find that reasonable expectation verified. He

tells us that the experiments were conducted during the years 1860 and 1861, upon a field which was cropped the first of these seasons with potatoes, and the second with wheat. The soil upon which the experiment was made is a lightish loam, of good quality, with a considerable slope towards the north. Previous to the potato crop of 1860, it had carried oats, following two years' pasture. The experimenter's first business was to secure good dung, which had been made in every respect in the same manner, with the exception of the circumstance of cover. For this purpose, a shed and court were selected, in which a lot of six cattle had been fed off upon turnips, oilcake having been added during the last six weeks they were there. As the one portion was entirely exposed to rain, whilst the other was perfectly excluded from it, and as the litter used and the food consumed were identical, the necessary conditions were satisfactorily obtained. Besides the two acres devoted to the experiment, a third was added for the sake of further comparison, which was manured with half the weight of dung and with five cwt. of portable manure, which consisted of guano and dissolved bones in equal quantities. The dung used on this acre was from the open court. The ground experimented on was as equal in quality as could be desired; and it would be difficult to assign a superiority to any one of the three acres. The potatoes used were Regents, which were planted on the 13th of April. The dung, which was in good condition, was applied at the period of planting. The three lots were manured in the following manner:

- Lot 1. 20 tons of dung per imperial acre, from open court.
- Lot 2. 20 tons of dung per imperial acre, from covered shed.
- Lot 3. 10 tons dung from open court, and a mixture of 2½ cwt. Peruvian guano and 2½ cwt. dissolved bones.

The potatoes were raised on the 1st of November with the fork, and the total produce of each imperial acre accurately measured, with the following results:—

	Tons.	Cwt.	Qr.	St.	Lbs.
Lot 1. Open court ..	6	8	0	0	0
Lot 2. Covered shed .	7	8	2	1	10
Lot 3. Mixed manure	7	9	1	1	6

It will be seen from the above that the dung made under cover produced 1 ton 2 cwt. 2 qrs. 1 st. 10 lbs. more potatoes per imperial acre than that made in the open court; whilst the acre manured with dung and guano, &c., although it produced a crop slightly in excess of the covered shed lot in the first instance, lost that small superiority in the process of sorting for market, and may, for all practical purposes, be accounted of equal value.

The next portion of the essay gives the result obtained with the wheat crop that followed the potatoes. This portion of a valuable and carefully-conducted series of trials, was exposed to very disturbing influences. Mr. Skirving describes these when he observes—

“The variety used was Mongoswells—a white wheat, which is cultivated to considerable extent in the Lothians. It was sown Nov. 22nd, and no dung or top-dressing was at any time applied, in order that the action of manure in the soil might remain perfectly undisturbed. During autumn and winter, I cannot say that I observed any difference in the braid of the three acres; but, as the season advanced, I saw, with regret, that the experiment was disturbed to a material degree by a cause which cannot in any way be attributed to the mode of manuring. The whole northern portion of the field had ‘thrown out,’ as it is termed, and the wheat, to a very considerable extent, had died and become blanky. The line of this comparative failure, which was distinctly marked, reached the experiment, and extended over one-fourth of the open-court acre, whilst it did not reach the other lots.”

The following figures may indicate pretty exactly the relative weights of the respective crops:—

Portion from open-court dung	15½ cwt.
Ditto from covered-shed dung	17
Ditto from mixed manure	16

The measurement of the above equal portions was taken where the “throwing out” had not so distinctly marked itself on the open-court acre.

The wheat was stooked separately, and, shortly after being “carried,” was thrashed, weighed, and measured. The following are the results:—

WEIGHT.	
Weight of open-court lot per bushel ..	60½ lb.
Weight of covered-shed lot per ditto ..	61
Weight of mixed-manure lot per ditto ..	60½

QUANTITY PER IMPERIAL ACRE.		Bush.	p.
No. 1. Open court, good grain ..		29	0
” ” grey ditto ..		1	3
		30	3
No. 2. Covered shed, good grain ..		33	0
” ” grey ditto ..		2	2
		35	2
No. 3. Mixed manure, good grain ..		30	1
” ” grey ditto ..		1	3
		32	0

I cannot give any trustworthy estimate of how much the open-court acre was damaged by the “throwing out;” but my opinion is that, but for that circumstance, it would have been little inferior to the other; and the experiment seemed to indicate—contrary to my expectation when the wheat was sown—that a second season had tended to equalize in a great degree the power of the two lots of dung.

In the same volume of the Highland Society's Transactions will be found another valuable prize essay, by Mr. J. Dove, of Eccles Newton, “on the comparative Effects of special and Farm-yard Manures over a four-course Rotation.”

These trials were made in four series, of half-acres of the same field; the soil a good clay, not very stiff, and having a mixture of black loam in it; the land being 220 feet above the level of the sea, with a gentle inclination to the south. The manures employed in 1860 were, per acre as follows:—

	Value of Manure.
	£ s. d.
No. 1. 16 tons of farm-yard manure, made in courts by cattle fed on turnips at 4s. per ton	4 0 0
2. 6 cwt. Peruvian guano at 13s. per ton	3 18 0
3. 9 cwt. of bone superphosphate at 8s. 6d. per cwt.	3 16 6
4. 13 cwt. of coprolite ditto at 5s. 10d. per cwt.	3 16 0

The average value of the crops of the rotation, obtained after these manurings, I will give in the subjoined tabular form.

First crop, 1859-60, Swedish turnips. Average value of the two series per imperial acre, at 8s. per ton.

	£ s. d.
No. 1	4 14 6
2	4 6 7
3	3 17 3
4	4 1 1

The average value of the second crop (barley) from

The two series of trials in 1860 was as follows:—The barley at 4s. 2d. per bushel, and the straw at 1s. per cwt.

	£	s.	d.
No. 1	13	13	4
2	14	9	4
3	12	5	6
4	11	6	3

The third year (1861) produced in these two series of trials a crop of hay, which was of the following value per acre, at 3s. 4d. per cwt. :—

	£	s.	d.
No. 1	6	2	6
2	5	12	6
3	5	8	9
4	5	6	6

The average value of the fourth crop of oats, in 1862, was per acre as follows:—

	£	s.	d.
No. 1	11	4	3
2	10	18	6
3	10	17	6
4	10	19	5

The total value of the four years' produce of the different manures, taking the average of the two series, was per acre—

	£	s.	d.
No. 1 Farm-yard manure	36	6	10
2 Peruvian guano	35	9	2
3 Bone superphosphate ..	32	11	3
4 Coprolite superphosphate	32	5	5

These trials are fraught with useful practical information. The result of comparing experimentally the value of the farmer's greatest help, the manure of the farm, prepared in sheltered and uncovered yards, leaves no doubt as to the superior value of that from protected places. It is only then a matter of calculation, the expense on the one hand of covering the yard, and contrasting with the necessary outlay the much increased value of the manure thus protected from the weather. It is probable that in the great majority of instances the advantage derived by the manure would considerably exceed the interest of the money invested in the required buildings; and, moreover, that by thus covering the now open yards, considerable benefits would arise to the live stock of the farm.

THE HERDS OF GREAT BRITAIN.

CHAPTER XLIII.

MR. WAINMAN'S PIGS.

Emblematic was blundering and stumbling hopelessly under eleven stone six over Doncaster Moor, when we passed that Ascot of Yorkshire, and for once did not care to stay. Towneley and Carhead were our double goal, and our routelay through Leeds, one of whose worthy members had just "been labouring under a cold in the head, and a sense of what was due to his constituents," on the assize question. Be that as it may, the Skipton railway has very little sense of what is due to common convenience, as its train started just as ours arrived; and thus for the lack of three minutes' law, we were left nearly three hours ruminating in Leeds. Visits to old battle fields are always fraught with interest. The shadows were fast falling on the golden acres of Sixty One, as, once more, we seemed to invest them with the long bannered lines of The Royal—three Gunter Duchesses, 77th, 78th, and 83rd, carrying the roan colours to the fore; Lord of the Harem and Grand Turk almost side by side with Lord Feversham's Fifth Duke; Sir Richard in his glory at the head of the white faces; young Nutbourne bidding defiance to "Sir John Barleycorn, well known with The Queen's;" Sanday's Leicester array, with George Newton as their esquire; Golden Days and Silver Hair grunting peacefully under their orange cards, so big with significance in the West Riding; Antony Maynard judging for the last time; and Jonas Webb sitting on a plough in the implement yard, and chafing (if that were possible) under the secret system whose doom was sealed that day.

Then we shoot past Saltaire, "that home of the fashions" and the bright lustre wool, and never wake again till, for the first time in our lives, we catch a glimpse of Keighley. It is a long formal street of a place, but absolutely chivalrous in its devotion to the cattle show, which furnishes the theme of its discourse, retrospective for six months and prospective for six more. Choice quintets of Shorthorns from Branches, Towneley, and Warlaby have stood in its ring, where Mr. Fisher is generally a judge of the donkey and dog department, and has an occasional turn at the rabbits. The owner of the donkey in the best

condition is rewarded with £1. Siladen Moor, Morton Banks, Baildon, and Oldfield Moor—all pour forth their long-eared treasures on the day, and staunch Society men will tell you that the candidates step along very differently to the coals, since this sovereign stimulus was applied, and that "prods" will soon be a thing of the past. Still, Keighley reserves its most touching sympathy for the pig, and £30 is given in "the labouring men's classes" alone. There are nine classes for pigs in all, and a cup for the best of them, but the competition is judiciously limited to a few townships round, and thus all pedigree dodging is at a discount. Attendance on their pigs and their Hamburgs, *alias* "chitty pratts," has been a grand counter-irritant, in many instances, to cock-fighting, poaching, and the beer-shop. At dinner time, the men will snatch half an hour for the former, to scratch them if it is wet, or walk them out if it is fine; and the gude wife seldom throws away her soap suds on a Saturday, without putting them to double duty in the sty. If the Keighley pig is at all like its Irish compatriot, it is "too proud to walk out with the children." The Society keeps a special van, which it lets out at a shilling a ride for "visits," and conveyance to the show ground, and many a journey it has had to old Flag of Truce and King of the West when they held their court at Carhead. Even sporting Yorkshire has not as yet soared to the Suffolk standard of sending postilion guardians in jockey caps; but the best blanket or rug in the house would be thought not one whit too good for the task, if the show fell on a very bitter day. The judges are most critically watched by a Court of Error, quite as learned in swine points as themselves; and the white, blue, pink, or green (extra) rosettes are placed with as much pride over the mantel-piece, as the Knight of the Garter's banner in the Windsor chapel of St. George.

Mr. Tuley, who was a weaver in Keighley, first inoculated the district with high art pig-feeding. He showed large sows with good success in the earlier days of The Royal; and, like a true enthusiast, he and his wife spent most of the eighteen shillings per week, which they made at weaving, on oatmeal for their candidate. His last entry was at Warwick; but the sow died coming home, and he

accepted the omen and showed no more. She might have been forwarder, but she could hardly rise to receive the judges, much less to show her paces. Towards the close of his life, Mr. Tuley did a little sheep jobbing, and the Duke of Devonshire built him a house on his little holding, which he christened "Matchless House" after his favourite sow. He was in fact the great pioneer of pig pedigrees, and he could generally get £5 for his *protégés* at two months. His wife was, as we have shown, a strenuous advocate for high feeding, and being no "two-handed Phillis," either at the shuttle or the razor, she "once shaven a pig for our maister," in those eccentric days, when "the fancy" preferred them with no hair. Keighley was also the earliest home of the middle whites. The judges were sorely puzzled, in 1851, with the different character and sizes of the large class candidates, and the committee were summoned into council. Mr. Sugden solved the difficulty with the promptness of his great legal namesake; and at his suggestion they were re-classified and double sets of prizes awarded, and this decision has been gradually recognized both by The Yorkshire and The Royal as thoroughly sound law.

With the exception of a few white crops on Morton Banks, there is nothing but old grass along the valley of the Aire from Leeds to Kildwick. It is parcelled out principally into dairy farms, stocked with Yorkshire and half-Irish Shorthorns, which supply the mill hands with new milk at 2d. per quart. Lonks, Cheviots, and half-bred Cheviots compose the flocks, and are crossed with a rough Leicester tup. The general aspect in an early spring is rather cold, and perpetual stone walls do not help the view, except perhaps when the Craven harriers are topping them. The road from the Cross Hills station to Carhead lies between Lothersdale and Cornshaw Becks, and a ride of rather more than two miles brings you within sight of the old Manor House. It is about two fields and a plantation off Mr. Wainman's present residence, and does duty as the home farm, with 95 acres attached. The herd is composed of ten or eleven Alderneys and Shorthorns, and the fusion has been successful in gaining the butter prizes at the Leeds Royal, and Manchester and Liverpool Society, as well as the Preston Guild.

Mr. Wainman is not very much at home, and when he is there, his principal pig fancy is for Silverwing and the smalls. The large sort may wait his coming for a twelve-month and a day. His bailiff, Mr. Fisher, was originally of "stable mind." He began as a lad with Perren when he trained for Sir Mark Sykes, at Settrington; and he won the Beverley Gold Cup on Falcon, nine-and-thirty years ago, in the crimson and white stripes of Mr. G. L. Fox. Weight prevented him from "taking silk" much longer, and he entered the service of the late greyhound and shorthorn Major Bower. He was with Sir Tatton at Eddlethorpe when old blind Comus was in the land, and when the long, erect figure of the baronet (who would never punish a horse or ride a severe rally home) was seen in the saddle for the last time on All Heart and No Peel for the Welham Cup at Malton. Then followed ten years as second horseman, and subsequently as hunting groom to Mr. Hall, of Scorboro', and in 1848 he came to Carhead.

No pigs, to speak of, had been kept there before 1853, when Mr. Fisher found the butter-milk rather difficult to dispose of, and bethought himself to go to Keighley and buy some of the Tuley sort. Mr. Berwick, a saddler, sold him Flora of the middle white sort, when she was near her pigging; and he bought a store pig and a sow, Yorkshire Lady, from Reedy, a labouring man. The store pig got the first prize in his hands at Keighley, and he went on with it till it weighed two-and-thirty stone. The sow was put to a boar of Mr. Horsfall's, of

Burley, near Otley, by Brutus (second at Windsor), from his celebrated Zenobia; and Checkmate, who was used very extensively for smalls and middles, was one of the produce. Mr. Swan's Midas was bought as a cross for this strain, and both he and Checkmate did well with Miss Emily, a purchase from Mr. Mitchell Walton, of Halifax. The Carhead sows had been second to her all round the circuit, and she joined them at the end of the season for 20 guineas, and took an H. C. and a second at Canterbury and Leeds. She bred five litters, and was one of the principal moulds in which the middles were cast. It always succeeded best the first time, by putting a large maiden sow to a small boar, and Mr. Fisher seldom tries it twice. In Missing Link and Craven Belle, the first and second prize sows at Battersea, the complete fusion was well illustrated both as to size and quality, and both of them were by King of the West (who seemed to have a patent for it) out of sows of the Golden Dream strain. Happy Link and Lucky Link carried it on the next year at Worcester, but the first of them was disqualified by pigging thirteen days too late. The Carhead average for the large breed has generally been about 34 stone of 14 lbs. at twelvemonths, for the middle about 30 stone, and for the small about 25 stone.

Mr. Fisher bought the first large bred sow of any importance in Lancashire. Riding along on his little chestnut mare—"warranted to cut down footpads in the moonlight, with ease and despatch"—he saw a man turn one out of a sty near Colne. Its symmetry and gay gallop down the field—which is always a rare sign—inspired him with "the uncontrollable impulse," and after a good deal of chaffering with her owner over the wall, £8 2s. 6d. was the price agreed on. She was sent to an Addingham boar, and Chelmsford Duchess, the first Carhead winner at the Royal, was one of the litter. She did not visit the show yard herself during her three or four years, but she also bred the Salisbury boar, and Chester Duchess by Carhead Duke, a combination of the Duchess and Reedy strains. The Duchess was beaten on the Roodee by Mr. Barker's Lady Havelock, but Mr. Fisher was not satisfied, and followed in her ladyship's track four times more during the season, and won the rubber. The winning pen of the large breed at Battersea were all of her breed. So much for the luck which turned Mr. Fisher's head toward's Colne. The Golden Dream strain had its root in an Addingham boar and a Reedy sow. From it came Golden Days by Sir Roger de Coverley, who was suckling her second litter of eleven young Carhead Dukes at Warwick, when she was two weeks short of seventeen months, and three of her first litter won a local first prize at the same show, when they were four-and-a-half months old. Old Golden Dream was never shown till her daughters had won; and it was in his rapture over three of her family by Lord of the Wassail that Mr. Fisher soared into "Advance Symmetry, Advance Quality, and No Surrender," and found no judge to demur either at Worcester or Kelso. The Lord of Misrule's breed is not exactly known, but his straight top and deep sides and width below decided Mr. Fisher to use him, and his son Lord of the Wassail from Chelmsford Duchess strain well justified the choice. Bright Hope was bought to put to him, and although she was not one of the biggest, she was eternally busy and successful either with prize or nursing cares. Fresh Hope, in a training point of view, has surpassed them all. She was by Flag of Truce, and took sixteen firsts last year, beginning with Otley. In fact, she was only beaten twice—once by her companion Rival Duchess, and once by a Berkshire, at Exeter. She then turned from the boar, and was sold for 20 guineas after winning at the Birmingham and Leeds Fat Shows, and her hams, which were nearly all meat, weighed 94 lbs. each! We had a look at

them in Mr. Fisher's cellar; and certainly, if we had been taken down without hearing the story, we should have thought that he liked a hippopotamus relish for his breakfast. He can eat it without any very deep regret, as the breed is not lost from the sties, which at one time last year contained about 168 pigs in all, of which four boars and seven sows had first Royal honours. Among the more celebrated boars, Flag of Truce was hardly wide-backed enough, but none had rarer hams and hair; Lord of Misrule was quite an Esau in his time, and Mr. Wainman has dressed many a fly by his aid; Sir Roger de Coverley got them all of the true Continental size; and for fine even litters nothing beat Lord of the Wassail. Comparing smaller things with greater, we have King Cube with model loins and flesh all-round, and his sire King of the West, the great getter of prize pigs, who took for his motto "King and Constitution," and invariably got his stock as hardy and larger than himself.

Mr. Fisher got his first taste for the small sort from Cumberland, whose "Mr. Justice Unthank" sent a couple of sows to Sir Charles Tempest and Mr. Sugden. One of them visited Checkmate, and Mr. Fisher fancied its substance and vigour so much that he kept a good eye on one of the sow pigs which Mr. Sugden had parted with to Mr. Davis till she had had a litter by Watson's Collegian, and bought her and her whole litter, save one. That sow was Silverhair, and crossed with King of the West, a Watson boar; she put Carhead into a good thing. "The King" was sold at a sale in Craven for £35, and the pigmen never got my word in." Some time after he espied his old friend in a pen at Warrington, and nowhere in the prize list. There was no mistake about those staring lineaments, although the bloom had departed considerably; but Mr. Fisher would not be denied, and effected an exchange with his second prize boar, and some money to boot. Never was man more relieved when he rescued his prize from the Lancashire Philistines, and bore him over the boundary line at Toms Cross—which is only three miles from Carhead—into Yorkshire. The beautiful Silver Wing was by him, from Silverhair, who had not quite the beauty and quality of her daughter, but had inherited the peculiarly light offal and short family head of her "Silver strain." Silver Web, Silver Wool, Silver Cloud, and Silver Lining (who has unfortunately two stiff legs) are still left of the sort, and King of the West, after being very extensively used, and let for six months to Mr. Umbers, has been bought by that gentleman out-and-out. There is also a little of the Windsor and Wiley blood in the small breed, but not to a great extent. The Carhead prize winning began in a very quiet way, with a couple of sows on the home circuit; and then Mr. Wainman broke ground at Lincoln Royal with an *H. C.* in 1854. There was no second in those days of more contracted Hanover Square revenue, and the sow of the large breed which had been bought with an eye to this trip across the Humber, was virtually "the runner up." Fortune was wooed at Carlisle the following summer, with a precisely similar result, but Chelmsford Duchess of Otley renowned basked in her royal smile the next summer, in a class where black and white, large cast in their lot together, and she was sold in the blush of her honours to Mons. Allier for France. In Mr. Fisher's mind she is still associated with "Fat, Fair, and Forty." The royal Salisbury sow seemed a certainty. She weighed 11 score 10 lbs. a quarter, and that too solid burden, with thirteen pigs inside her as well, brought on asphyxia in the South Western truck, and they had only just time to kill her. The Chester return was *nil*, but a second in the large sow class, and the first prize for a pen of young pigs of the large breed, squared matters at Warwick. Golden Days held her old place in the pilgrimage to Canterbury, whither

she was accompanied by the Lord of Misrule, who won the first prize ever given by the Society for middle bred boars. She and Silverhair were also prophets in their own country at Leeds, as heads of the large and small sow class, which latter was a new feature of the Brandreth Gibbs programme. The middles also bore up well for Carhead, and had two seconds with Bowchaser and Miss Emily, in the teeth of Yorkshire and Lancashire. Six firsts and two seconds formed a truly international success at Batterssea, five of them in the sow classes, where Bright Hope, Missing Link, and Silver Wing, typified the three sorts; but the boars, Worcester Duke, bought from Mr. Harrison of Stockport, Nabob and King Cube, both by King of the West, were in the front at the battle of Worcester, where Mr. Fisher made his grand *coup* of eight firsts and one second in ten classes. Fresh Hope and Lucky Link were both in the right place, and the defeats of Silver Web and Heartsease, of "the light division," found good hedging in the fact that the first pen of small sows was of half, and the second prize small boar of full Wainman blood. The first prize family party was a peculiarly interesting one, composed as it was of Lord of the Wassail, Bright Hope, and fourteen at the teat. Nineteen young pigs, chaperoned by Silver Wing, Silver Beard, Duke of York, Rival Duchess, and Middle Link, had sailed for Hamburg a fortnight before. The seniors, as a fitting reward for their excellent sea legs, got pretty nearly all they could get from a committee which attached more importance to gilt cards and waterfalls than prizes; but the nineteen did not recross the German Ocean, and Messrs. Crisp's and Sexton's shipload also underwent a most satisfactory elimination.

The circuit season generally opens at Accrington in April, and lasts till the Leeds Fat Show. Once set a going, the crates seem to visit every part of the British compass. Yarmouth is quite an annual tryst, and they have traversed the far west to Exeter. Although a staunch "ribbonman" in the highest sense of the term, Mr. Fisher has only once taken his talented company to perform in Ireland, when that scene of their labours was at Belfast. One year they paid a flying visit to Worcestershire, and took every shilling (£18) like Gully and Justice when they were wont to make one of the dashing forays of their youth on to a provincial racecourse. At Newport they met with a heavy reverse, and although four real clippers were selected for that journey, they came back "without a guinea and without a friend," from their contest with "the Irish-looking blacks and whites."

Big Kit and Little Kit are the reserve force in the height of the season. The latter, whose biceps muscle was quite a marvel to Mr. Gourlay Steel, will figure in his great Highland and Agricultural Society's picture along with Silverhair. They have no "sealed orders," but Mr. Fisher nails the names and classes of their charges on to the crates, and they generally turn up again to an hour with a packet of prize cards. Last August, for instance, one of them was placed in command of two boars and two sows, large and small, and sent off to Driffield and Bridlington; and the other, descended at the head of a similar force upon Gateshead and Hexham. They won all they tried for. Then Mr. Fisher met them with "Dick" and the main body at Newcastle, and they went and made some fine practice down at Kelso. The Smithfield gold medal is quite out of the peculiar Carhead line, and the medal for the single class is not very tempting. For two years together Mr. Wainman has won the prize for the single pig above eighteen months at Birmingham, and his eleven months and one week middle, which headed the class at Leeds last Christmas, was within 6 lbs. of 33 stone. The last season was by far their greatest, as they showed at thirty-three meetings, and won a hundred and twenty-one firsts, and fifty-one seconds, which produced something

more than "the barren leaves of honour," in £464 16s., one silver cup, and five silver medals.

The principal pigging time is in the spring and October. The rule of the Royal Agricultural, which requires the sows to pig before the 1st of September, find no favour in Mr. Fisher's eyes, as it entails "a retirement" during the height of the show season, and renders the progeny useless in point of age for making up pens. The result of his training experience is that show sows will breed, but not nurse their pigs as well, and seem to lose the "fend"—*Anglice*, vigour—in their milk veins. There is no sitting up with them, as it only makes them nervous, however well they may know their attendant, and the key is generally in Mr. Fisher's pocket till all is over. A warm-water injection entirely supplies the place of medicine; and in summer the breeding sows always run out in the pastures, and revert as far as possible to a state of nature. In the house, their principal food is a mixture of wheat dressings and barley-meal, three-fourths of it wheat, which costs 1d. per lb. To this sharps and pulped turnips are added, but the boiler is never at work except for the young pigs in cold weather; and oatmeal, which Tuley's disciples at Keighley generally use for "the last dip," three weeks before the day, is a name unknown at Carhead.

The golden rule of the establishment is never to refuse to sell if you can get your price. Yorkshiremen generally run on the middle or large breed, and fanciers on the small. Australia, America, Prussia, Holland, and Germany have all been customers, principally for young boars and sows of the large breed. Some of them are dreaming their lives away in the sties of the King of Hanover and the Queen of Spain; and for three successive years, the Emperor of the French has been most constant to the blood, both in its large and middle form. Scotland buys well at a fair price, and has no eye save to the large. They are generally sold off between two and three months old, and Chelmsford Duchess, £40, is the premier price so far. Still the sale of the Chester Duchess litter is the crowning triumph of all, as the twelve made £117 before they were ten weeks old. Even then there was one left, and he lived to be called Sir Roger de Coverley and win sixteen prizes, and departed to Russia at 20 gs.

The pig circuit time was not yet, and "the two Kits" were busy weiring in Cornshaw Brook as we passed down the dell and over the rustic bridge in the grounds on our way to the Manor Farm. It is approached through the Tunsteads, a fine grass meadow on a slope, where the sows run out from May till October. A small barrow of earth on the sunny side of the hill marks the grave of Silverhair, who died a few months since in the fulness of her fame, after farrowing seven litters, principally by King of the West. She did a first-class show business in her day, and one of her seventeen firsts was won in Ireland. Mr. Hatton, of Addingham, once beat her with a small black at Halifax, but she had her revenge elsewhere. There have been as many as twenty breeding sows in the Tunsteads at one time, and they go down-hill to lie up, or when they are taken up for show. King of the West and The Nabob had also two ticket-of-leave summers here. They lie at night under sheds attached to some outbuildings, and the remains of the summer commissariat were still there in the shape of oat-dust (which costs about 3s. 9d. a sack), mixed with pulped turnip. This article forms a prominent feature in the tally-board on the door of the canteen at the farm, along with barley-meal, sharps, and bran, but Indian corn has no chalk mark against it.

Silver Spur by Lord of the Wassail, from Golden Hope, a daughter of Golden Dream, was the first to answer to the crack of the whip. He is one of the large sort on rare legs, with a fine level forehead, and good enough to win at York and Pontefract, when he was under twelve months. Next to him was another "big 'un"—Worcester

Duke (late Albert), and purchased from Mr. Harrison, of Stockport. He is far more a show pig with a rare top, wide underneath, and a nice head and eye, but rather small in the ear, and not large enough for the Scottish taste, which placed Mr. Dickens's and Mr. Findlay's before him. After this we invaded the privacy of four or five (some of them Platonic) couples. The first were of the middle sort, Lucky Link, a most evenly-made one, with beautiful offal, and Bend Sinister by Flag of Truce, a remarkably lengthy fellow, and with meat up to the very tip of his under-jaw. Then came two Kings of the West—to wit, Silverwing of the beautiful ham, head, and hair, who has won nearly thirty first prizes off "dust" and turnips, and King Cube, her true knight, and a very great winner. His name denotes his properties; and though, when you look him over first, you think it is his loin, it is difficult to say that one part is more perfect than another. Pigs are generally at their best between two and three, but he left the latter goal behind him in October, and is steadily blooming yet. British Workman had the genuine Flag of Truce ham, but was better at a side than an over-view; and Silver Wool, another of the Silverhairs, shared his trough. The Nabob was a fine boar, but not so level as some of them, and his companion, Happy Link, had such sweet bone, that we turned away towards the nursery almost a believer in the hitherto apocryphal bone of the easels.

A turn of Mr. Fisher's key revealed Rival Hope by Lord of Misrule, stretched many a rood in the pigging-room, which is duly furnished with balustrades, to prevent the sow getting against the wall, and we soon left her in the hope before night-fall of another of those large litters, for which Lord of the Wassail is so famous. Northern Garland of the middle sort was in the row behind, and had just smothered four out of her eight, and there too were Silver Web in pig to King of the West, and Silver Cloud, with a first litter of seven by him. Silver Lining was another of the light weights, and devoting herself, cripple as she is, to a maiden litter of similar strength. The next was a six months boar, and quite one of the plums, the very type of Silverbeard, his father, and out of the dam of Silverhair. His beautiful hair and rare top and bottom delighted us as much as anything there; and as he was nameless, and the golden age has gone never to return, except in song, we scored him down as "Silver Age." Muslin, a purchase at Mr. Ambler's, was a stage beyond Rival Hope, and two were already born and at the teat, so she was left to her meditations. In Royal Hope by Lord of the Wassail we found the only relic of Fresh Hope's two litters; but she was going gaily along for Newcastle, and rather ill-tempered over it. Rival Duchess proved to be the biggest about the place; and, in fact, the Chelmsford Duchess strain has always been larger than the Golden Dream. Once on a time, too, she met Fresh Hope at Halifax, and had the best of the trial. Silver Star was the only one left of the pen of three middles at Worcester, and although Golden Reel did not just look the sort, she has been as lucky a breeder as her dam Golden Days. She was put to the boar at eight months, and has gone on like clock-work since then,—regularly twice a year. Now three Berkshires of the Goodricke breed stopped the way, as it is well to suit all tastes, and the baronet's blood was also to be found in the squadron of yellow and white setters, Flirt, Floss, and Co., in the meadow which holds Lord of the Wassail. Our impression on seeing the long gaunt frame of "Booth's Carlisle bull" Windsor, wandering in the pastures at Mr. Bruere's, not many months before his death, came back on us, when we looked at this boar, who had lost fully 20 stone since he barked his hairy length in "the boar, sow, and offspring" class at Worcester; and he was now quite a wild pig in shape and condition, as he peered up at us under the sycamore. Battersea Duchess

and her daughter were both in-pig by him, and important components of the fourteen which had litters either *in esse* or *in posse*, and when three out of six loiterers under a shed near that extraordinary platoon of rat-tails had been pointed out by Mr. Fisher as one of Lucky Link's Wor-

cester twelve, and two of Bright Hope's fourteen, we joined the Burnley train six miles across the country at Colne, and passed into a golden dream of the coming Towneley average.

H. H. D.

MODERN POTATO CULTURE.

Ever since the first attack of the potato disease, the growth of the potato has been a subject of great and increasing interest. It is so at the present time, and the advances made in its culture, and the improvements effected in the varieties of it, are very great. I have often written upon this subject, and I might therefore refer my readers to my previous papers; but as they are not always at hand, I may, at great risk of recurring to the same observations, pen a few remarks for their consideration. This is the season for "setting" the potato, and a finer one for the operation cannot be desired. The soil works admirably, and the weather is all that can be wished for.

The first great improvement I shall notice in potato-culture, is the attention paid to secure a deep, friable, and well-pulverized mould. The land is deeply ploughed in the autumn, re-ploughed or cross-ploughed in the earliest suitable weather in the spring; thoroughly scarified, dragged, rolled, and harrowed in dry weather; the rubbish is picked off, and all is made ready for "the setting." The land should be got into that loose and open condition so that all may be ridged at twenty-eight inch intervals, and ploughed up to fifteen inches in height, the whole being one running mould. Potato cultivators of the present day are not content unless they attain this high order of culture. To accomplish this, all other farm operations are for awhile suspended, in fact, till this is achieved. In the district from which I write, nearly every grower has this year been fortunate enough to effect this desirable condition of the soil, and the setting is proceeding most satisfactorily. It is altogether a great boon to the poor inhabitants of the district. Nearly every available hand is engaged—men, women, and children are fully employed—men at two shillings, women at one shilling, boys and girls at from sixpence to twopenny per day.

The next great improvement I would notice is the attention paid to secure ample manurial dressings. This is found to be most essential in order to secure a heavy and remunerative crop. It must be always borne in mind that it is a crop of "marketable ware" that leaves a profitable return. It is not always the greatest quantity produced, but it is this combined with size and quality that pays the grower. Hence the aim to cause a growth of large tubers. For this purpose ample dressings are requisite as well as high culture. Few growers of any repute will plant their crops without artificial dressings of manure in addition to fold-yard dung. Many will plant upon a strong dressing of artificial "potato manure," without dung; but I think it is not a wise practice. Artificial aids may be looked upon chiefly as stimulants; fold-yard dung prolongs its benefits to succeeding crops. The stimulants are soon exhausted. Potatoes leave no returns for manure: nearly all is taken from the land, which in some crops, of varieties growing much haulm and many tubers, is very detrimental. Rocks, for instance, are very exhaustive. The quantity of manure applied varies considerably throughout this extensive potato district. I will notice some few instances: No. 1, an extensive grower, applies in some cases ten two-horse cart loads of dung, made from straw consumed with oilcake and roots, and 5 cwt. of artificial manure, or 3 cwt. of

Peruvian guano, or occasionally 4 cwt. of Peruvian guano with somewhat less dung. No. 2 will apply 4 cwt. of Peruvian guano alone. No. 3 will apply 10 two-horse cart loads of dung, and 1½ cwt. of Peruvian guano, or 1½ cwt. of blood-manure. No. 4 will apply the like quantity of dung, and slight artificial aids; the dung being improved by large additions of shell-fish (mussels), in addition to cake and roots. No. 5 will apply the like quantity of manure, and artificials collected in the neighbourhood—*i. e.*, night-soil, &c., &c. No. 6 will apply from 10 to 14 two-horse cart loads of well-made dung, without artificial aids. All these are put in upon the ridge system, and the artificials are mixed with ashes of twitch, sods, &c., and sown along the ridge trench.

The next improvement I would notice is the extreme attention given to secure good seed, from "good stocks." Many of our first-class growers import large quantities of seed from considerable distances. The Scotch varieties are most popular. Some of our growers are this season planting from seed from Dunbar; others from the loams along the Trent valley; others from the black Fen-land. Others, again, will depend upon a well-selected stock, without reference to change of soil or climate; others will exchange seed from marshy loams to loams on higher elevations, and *vice versa*.

There is much benefit derived from attention to these things; and, without being able to define the causes of success, it suffices the growers to know by experience that such is the fact. It is by no means attended with uniform success. It often turns out that imported stocks are very imperfect. Of three varieties of the same stock (Walker's Regents), imported from Scotland last year, two proved very inferior, the third a superior sample, and proved well, yielding large tubers, of much greater value. The Dalmahoy Earlies have been planted early, and in larger breadth. The Fluke still holds its popularity, and will be planted freely. Regents are again recovering their position, and large breadths are in course of setting. Rocks, from their prolific character, will retain their standing. Skerry Blues increase in fame, and are spreading far and wide, owing to their freedom from disease or rotting. Snowballs are said to be the most profitable of all varieties: they are prolific, and command the market. Myot's Seedlings are highly spoken of; but they appear to be better adapted for garden than field culture. Other sorts are making way in the district. The Red Regent is a fine variety. A Yorkshire seedling grown here (white) is of beautiful quality, round, but rather small. These are the principal varieties now cultivated in this fine potato district. I would say that I fully believe, if there were better varieties to be found, our growers would soon be in possession of them.

Another improvement is the great attention paid to prepare the sets. This is the result of experience. The Fluke is selected with care, and the aim is to plant those of uniform size and form (flake-shaped). The Rocks and Skerry Blues undergo examination; and superfluous eyes require to be cut out, because they produce a superabundance of haulm. Regents, Snowballs, Dalmahoyes, are carefully looked over. The large tubers are cut into proper sets; the smaller ones are deprived of superfluous

eyes, a few good stems being far better than a crop of haulm.

The last improvement I shall notice is the attention given to the planting ("setting"). The Flukes, being slow of growth, and producing but little haulm, are set thickly in the rows—certainly not exceeding a foot apart. The Skerry Blues and Rocks are planted fully sixteen inches apart, on account of their excessive produce of haulm. All other varieties are planted about fifteen inches apart, and all in rows from twenty-eight to thirty inches asunder, generally upon the ridge system; but some still prefer the old method of planting every third furrow upon the flat. The great aim, however, is to secure plenty of mould; and, that being done, it is not so essential to plant on ridges. In dry weather it is best to roll the planted land down; but in moist seasons it should not be done.

The subsequent culture is very simple. As soon as the rows of plants can be seen, a ridge-harrow should be worked between the ridges or rows, so as not to injure any sets. In a few days the first horse-hoeing should take place, to be again followed, shortly after, by the ridge-harrow, the object being to keep all clean, and prepare and retain a well-comminuted soil for the final moulding-up. Hand-hoeing must speedily follow the first horse-hoeing, and previous to the harrowing. If the mould proves scant, the space between every ridge should be subsoil-ploughed, and again harrowed. It is to little purpose to commence the final moulding-up, unless an effective moulding can be secured. This is very essential to the final prosperity of the crop. Many growers give two mouldings—the first a partial one, so as to give additional mould for young rootlets; the second to cause the full formation and development of the tubers.

NOT TO BE LOST AT SEA.

The sewage question is again revived, and bids fair to be fought by the ratepayers of the metropolis on wholly fiscal grounds. They formerly issued an order for their garbage to be summarily ejected at two points of the river, below London; but hearing that they are throwing away a clear two millions of money a year, they have questioned men of science about the matter, and now commit their former decision for re-consideration.

The first idea was to get rid of the sewage. Purification at any price! that was the cry; and a good cry is essential to the success of any agitation. Great George-street, desirous of seeing public money disbursed in great engineering schemes, backed up the protest against fouling the river; for when once the idea of restoring the glorious Thames to the reputation it bore in the time of Pope takes possession of the public mind, the formation of splendid quays, spacious roads, and lines of princely buildings naturally follows; and the C.E.'s are wild with the prospect of the millions of money that will be lavished, and the fortunes that will be made. Physicians, doctors, chemists, and sanitary inspectors—all deposed to the enormity of the nuisance, and pocketed fees in proportion to the strength of their depositions. A few voices were raised against this procedure, but they were lost amid the determined cries, "Away with it to the sea; no parley with the pest that corrupts our water and contaminates our air."

Thus urged on, the Board of Works felt justified in undertaking the enormous enterprise for the main drainage of London now in progress, and of taxing the citizens to pay for it. Levels were made, plans were brought out; and it was finally agreed to collect sewage from the Surrey and Middlesex sides of the Thames, to run it by two channels parallel with the river, and to void it at two points so far below London Bridge that the offence would stand no chance of being brought back by the tide. It was utterly, as I said, *to be got rid of*; and although much was said condemnatory of this course at the time, it is clear that the Board of Works thought only of ridding the city of a nuisance and saddling the parishioners with the expense.

When this was all arranged, the Royal Commission was set to work to test the value of town sewage as applied to land—principally to grass land. The report, if I remember right, did not speak very highly of this liquid-manure, and stated that in consequence of its excessive adulteration with water, the farmers would never be willing, and, in fact, could not afford to pay anything for it.

Other views, however, got abroad. These originated for the most part with the indefatigable Liebig, who, by his predictions of sterility for the land of England should so wasteful a system of drainage be carried out by the municipal bodies generally, aroused the public mind to consider this point. Mr. Mechi, too, contributed his voice to swell the expostulation of the minority; and in process of time Parliament was stirred, and a select committee was appointed to investigate and report on a matter which so nearly concerned the national interests.

Both parties whipped up their witnesses. I use the word above (in italics) because, to one reading the evidence, the witnesses for and against seemed to be animated by a feeling somewhat stronger than would characterize a simple disinterested search for truth. If one judges, too, by the questions of the committee, certain points were designed to be brought out in cross-examination, which, by exhibiting interested motives in the witness, might damage his evidence. Whether or not this was really the case, however, the inquiry gave rise to a great deal of fun, for the chemists and scientific men were pitted one against the other, and contradicted each other in a most remarkable and conclusive way. It was as good as any of the special lunacy or poisoning cases which have of late years given the faculty famous opportunities of ventilating their individual theories with respect to human accountability, and the like.

The report drawn up by Dr. Brady, the chairman, was decidedly in favour of utilizing the sewage of towns, and spoke of it as a manure which would be valuable to the farmers, at a price. Discussion ensued upon this report when it was presented to the House; it was decided to be not in conformity with the evidence adduced, and was forthwith cancelled.

During the progress of this inquiry some two or three heads were scheming. Hope dawned with respect to the utilization of the sewage, or at all events with respect to certain profits accruing to any person or persons who might be fortunate enough to devise a plan by which the main sewers might be tapped above the outfall, and their manurial fluid contents withdrawn, and supplied to the land.

Before this, however, the Board of Works was within an ace of giving itself to Mr. Napier's project. That gentleman, on the presumption that the sewage was to be had for nothing, filed at the Private Bill Office of the House of Commons a speculation called "The Metropolitan Sewage and Essex Reclamation Company," and

he was invited to lay his plans before the Main Drainage Committee.

Mr. Napier proposed to take the dry-weather sewage of the north side of the Metropolis, amounting to 10,000,000 cubic feet per day, and to conduct it on to 20,000 acres of sand, lying off the sea-coast of Essex. These Foulness Sands and Dengie Flats are, it appears, covered by the sea at "two hours' flood," and would therefore require a sea-embankment twenty-six miles in length to enclose the area—a work of enormous expense.

His project having been disposed of, the Board, now setting a value by its refuse, advertised for tenders to be sent in by the 7th of May last, and the three following were then received: Mr. Napier's, Mr. Ellis's, and Lord Torrington's.

Mr. Napier's plan was virtually the same as the one already described, with the additional promise to pay to the ratepayers one-half of all profits, after deducting ten per cent. on his outlay.

Lord Torrington, who proposes to put the entire sewage of the Metropolis on 30,000 or 40,000 acres, offers the Board "a per-centage on his profits," leaving his rent or royalty to be determined by an arbitrator appointed by the Board of Trade.

Mr. Ellis proposes to distribute the sewage from a summit-regulating reservoir on either side of the Thames, through pipes laid along the roads of an area of 1,680 square miles, or more if necessary. He proposes further to lay down all the works of distribution at the expense of an intended company, and to undertake all outlays and risks of every kind, guaranteeing the Metropolitan Board of Works and the ratepayers, by a special Act of Parliament, from all liability, including that of partnership. He proposes also to deposit £60,000 for preliminary expenses, to raise no capital until his scheme has been sub-

jected to a rigid Parliamentary inquiry, and to abstain from advertising his company till the Board approves his directors, and the sum of half-a-million sterling is subscribed by his private supporters. He undertakes to pay an annual rent for the sewage equal to one-half of the net profits derived from its sale; and this, if estimated at the value of its solid contents, would produce a revenue somewhere about equal to one-third the entire local taxation of the Metropolis.

The two first propositions are to put the sewage on lands which are to be the property of their companies: Mr. Ellis's proposition is confined to works of distribution, the farmers becoming purchasers of the sewage.

A supplementary tender was received from Lord Torrington some time after (October), in which he seems to have abandoned his plan of purchasing land for the reception of the sewage—proposes to go to work like Mr. Ellis, to supply the sewage to some 250,000 acres; and, I think I am correct in stating, to pay such a proportion of the net profits resulting from the Company's operations as shall represent a dividend of 2 per cent. on the Company's capital (£500,000), shareholders having first received 7½ per cent., and the board guaranteeing the Company against all actions brought against it for the use of the sewage.

For some reason or other the Board of Works refuses to grant Mr. Ellis the concession, although his proposal promises most profit to the ratepayers; and an agitation is now going on, in the various city wards, for the purpose of eliciting the expression of municipal opinion on the subject. Several meetings have now been held; some have resolved to support Mr. Ellis's proposition, and all appear to think that Parliament should be urged to grant another inquiry, and to relieve the Board of Works of all further responsibility in this case.

AGRICULTURAL EDUCATION.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Wednesday, April 20th; Lord Feversham in the chair—Mr. HOLLAND, M.P., delivered the following lecture:

My Lord,—In introducing this subject to the meeting I am afraid there is a certain amount of dryness in it, inasmuch as we are all agreed on the necessity of something being done in the way of education for the agricultural classes. In general, the subjects for discussion have taken two or three different phases according to the nature of the land, the climate, and the latitude, one individual being different as regards climate and latitude from another. Therefore in matters of agricultural practice, there are different views arising out of these circumstances; but with regard to education, that is a subject in which we all feel an interest, but which we hardly know how to handle in consequence of our not having any system of education connected with the agricultural interest. A few years ago the question would not have been mooted in this Society; but the growth of civilisation, the way in which man is now forced to make some exertions if he lives in society, or in any particular class in a free country, and the manner in which he has to compete with his fellow-men, requires that no class should be backward in the acquirements of the age, and prevent the class which happens to be backward from flourishing, and taking due advantage of the times in which it lives. Now, with regard to the question of education in connection with the agricultural interest, I

would refer to what I know was the answer of an engineer of some repute, who is connected with this Society, when asked the question how a young lad should be brought up for the purpose of becoming eventually an engineer. The reply was, "Send him to King's College, or to some other large public establishment of that nature." But then came the enquiry, "What do they teach of engineering, there?" "Never mind," was the reply, "do not think at present of his future profession; think only of his having a large ground-work, a great basis for a good general education." The same argument would apply to the early education of a member of the agricultural body. The fact is, that whatever our ancestors may have done in the shape of education was not a necessity. On their parts, it was owing to the peculiar habits or tastes of the individual if he became an educated man; but education was not required for life as it is at present. With our sons and future agriculturists education is a requisite, a necessity; and that necessity must be met. The question, then, is, how shall it be met? Every one that would hold his own in these days must work; and this is a condition gradually pervading all classes, not the lowest alone, but the very highest. In connection with the subject of education, there was put into my hand yesterday a pamphlet which everybody ought to read with a great deal of interest. It is one of those papers which have emanated from the pen

of the Rev. Prebendary Brereton, of Exeter—papers which have issued from him for the last few years at different periods, in connection with the education of the middle classes. Not only has that gentleman done great service by the manner in which he has handled and made known the wants of the middle classes; but he has gone practically to work, and, through his position and peculiar qualifications, has been able to make those who have power and authority in his own county, and the public of his own county, to take an interest in working out practically views which he has submitted to them. In placing the question of education before you, the first thing to consider is—what is education? It has been quaintly declared to be the placing of the growing human creature in such circumstances of direction or of restraint as may make the most of him. It is the machinery for furnishing him with such information as will be practically serviceable to him in his future life. In considering the question with regard to the farmer and the agriculturist, we must remember that there are three classes connected with the land—the landlord, the labourer, and (the intermediate class) the occupier; just the same as there are three classes connected with society—the wealthier, the labouring, and intermediate class. Now, the report of different public offices in this country show that that intermediate class has been sadly neglected. Mr. Bellairs, one of the inspectors of the Privy Council for Education, says: "I am afraid that in my district (that is, Gloucestershire, Worcestershire, and Warwickshire) there are few instances of schools for farmers, small tradesmen, artisans, and others of that class; and yet it would be difficult to mention any description of school that is more important. There is no class of society so imperfectly educated, or where opinions are so crudely formed." Again, Mr. Brereton, also speaking of the wants of the same class, says: "The comparative deficiencies of middle-class education in England may be attributed to the single fact that, neither in the development, during this century, of the higher system (that is, the system of public schools, colleges, and universities for the wealthier classes), nor in the establishment of the lower—which has reference to the state of education given to the poorer classes, of which, by the way, the large body of occupiers of land, as well as the middle classes, are the chief supporters through having to pay the rates—has there, as yet, been provision made for the large intermediate class who can neither aspire to the former nor condescend to the latter. There are indeed many advocates for so extending these two systems as to embrace all the upper middle-class in the educational system of the gentry, and to absorb the remainder in that form by the help of the State for the labourer. It is also still an open question, though not likely long to be so, whether public opinion will acquiesce in the permanent establishment of those subsidising examinations which the universities have recently undertaken for the middle-class, or whether it will adopt the proposal to establish, in connection with the different counties, a new educational system, with its own public schools, colleges, and university." Now, with regard to the intermediate class; that is of course its more wealthy belongings—those who do take advantage of the colleges and universities established for the rich, as far as it is in their power to do so. I suppose, on the other hand, there are also a certain number of the poorest of the occupiers who would still be included in the middle-class, and who may take advantage of the schools that have been established through State influence. But the great mass of the middle-class are without any means of obtaining an education commensurate with their wants. Referring to this, Mr. Brereton continues: "In either

case we may hope that a standard will be gradually fixed, both for general knowledge and for special studies, which will remove the existing uncertainty of object and irregularity of method, which are equally injurious to the teacher and the taught, to the school and the home." Then, attending particularly to the farmer, for his pamphlet is intitled "Education as connected with Agriculture," he observes: "The effects of such a definite standard upon the English farmer's family can hardly be overrated. When once it becomes recognised as the rule that all the sons of the family should complete their education by obtaining a degree, the habits of the household would be regulated accordingly; and the more necessary arrangements for study would open, in the seclusion and frequent leisure of the farmer's home, prospects of domestic order and happiness hitherto almost unknown. Such an object alone, without reference to the means of its attainment, would ensure this. Frequently the holidays of the schoolboy, the vacation of the collegian, or the daily pursuits of the home student, would have this effect, extending also indirectly to the female workers of the family. Such is the connection which the farmer has with the large middle-class; and a section of that class to which immediate reference is made to-day is the agricultural section, in dealing with which there comes in the great difficulty, that we hardly know whether there exists the machinery for bringing into play all that can be requisite, in as quick and speedy a manner as the present generation requires. There is a demand for it; I think there can be no doubt of that. But how is the demand in this section of the great middle-class to be met? During the period that they are at school, general education of a public nature is all that is required. As Mr. Amos very rightly remarked: What makes the difference between a public and private educational system is this, that the public system, being as it were public property, lays itself open to the approbation or disapprobation of the class which requires it for its own benefit; and, at the same time, there is in connection with public education a certain amount of stimulus given in the shape either of scholarships, prizes, or some particular mode in which honours are bestowed, and which gives to the individual receiving such honours a certain status in his class, or certain position among his fellow-students; and, if the examiners for such honours be what they ought to be, an opportunity of displaying what there is in him. For this is the peculiar meaning of the word "education." It is very different from the meaning of the word "instruction." Instruction may be the giving a certain amount of learning, but education is the bringing out what there is in the individual. There is a demand, then, no doubt of it, and the want is widely felt. I think myself that the nature of the education ought to be public, like that of the children of other sections of the middle classes; but, after conferring those honours at school, and after the education of a public kind is thus connected with the agricultural individual, yet more is wanted. Even before the time has elapsed when the connection between the boy and the college is still going on, and even during that time, there ought to be some connection between the practical working of the land and the future farmer. And here is one of the difficulties with which we have to contend: here, in the education of the farmer, we leave the mass of the middle class, and go to the individual section of that class which we wish to benefit. Mr. Grey, of Dilston, who is a great authority on this question, in the course of a speech which he made in the north some time ago, said: "The time has gone by, with too many of us, to profit by the improved education which the present state of society requires and affords; but allow me to remind such of you as have the

responsibility of being parents, of the duty incumbent upon you to educate your families so as to fit them for taking a respectable position in life. It is the best patrimony which you can bestow upon them. A liberal and judicious course of education is the foundation of future acquirement. It opens up the sources of knowledge, and gives vigour and opportunity of expansion to any peculiar tendency of intellect which the mind is disposed to. Without it, no man need expect to keep pace with the onward movements of society, or to make his way in arts, manufactures, or even agriculture, to which some knowledge of chemistry and the natural sciences is indispensable." Then, having done with the education connected with agriculture, we have next to consider the second agricultural education based upon the broad foundation of general education, which is to be obtained at one of the public institutions of which I speak, and of which I hope, through the exertions of Mr. Brereton and others, and the example set us in the county of Devon, we shall see many more soon scattered over the country. Mr. Wilson, of Edington Mains, the author of "British Farming," gives his opinion with regard to the rising young farmer in the following terms: "The mere possession of capital does not qualify a man for being a farmer, nor is there any virtue inherent in a lease to ensure his success. To these must be added probity, knowledge of his business, and diligence in prosecuting it. These qualifications are the points of good education in the fullest sense of that term, and are no more to be looked for without it than good crops without good husbandry. * * * But a great difficulty at present lies in finding appropriate occupation for such youths betwixt their fifteenth and twentieth years. In many cases, sons of farmers are, during that period, put to farm labour. If they are kept steadily at it, and are made proficient in every kind of work performed on a farm, it is a good professional training as far as it goes. The more common one (at least, as regards the sons of the larger class of farmers), which consists of loitering about without any stated occupation, attending fairs and markets, and probably the racecourse and coursing field, is about the most absurd and pernicious that can well be imagined. Such youths are truly to be pitied, for they are neither inured to bodily labour nor afforded the benefits of a liberal education. It would not surprise any one that such hapless lads often prove incompetent for the struggles of life, and have to yield their places to more vigorous men who have enjoyed the benefit of 'bearing the yoke in their youth.' Unless young men are kept at labour, either of mind or body, until continuous exertion during stated hours, confinement to one place, and prompt obedience to their superiors, have ceased to be irksome, there is little hope of their either prospering in business or distinguishing themselves in their profession. Owing to the altered habits of society, there is now less likelihood than heretofore of such young persons as we are referring to being subjected to that arduous training to bodily labour which was once the universal practice; and hence the necessity for an appropriate course of study to take its place. * * * It is also common for such youths to be sent to Edinburgh for a winter or two, to attend a class of our accomplished professor of agriculture, and perhaps also that of chemistry and the veterinary college. This is well enough in its way; but yet there is wanting in it an adequate guarantee that there is real study—the actual performance of daily mental work. After enjoying the benefits of such a course of training as we have now indicated, young men would be in circumstances to derive real advantage from a residence with some experienced practical farmer, or from a tour through the best cultivated districts of the country." These are Mr. Wilson's views; and Mr. Norton, in a lecture which he delivered at the Royal Agricultural College, laid down these three points as essentials to the practical farmer—1st, that he should have practical skill; 2nd, that he should have business tact; and 3rd, that he should have a liberal and scientific education. Now in taking these three points into consideration

Mr. Morton observed that if a man had mere practical skill he was very little better than a labourer; that if he had business tact, he might not only be a labourer, but become the manager of a farm; but that without having, in addition to his capital, a liberal and scientific education, he was not fitted for holding a large farm in the present day (Hear, hear). In this I thoroughly agree; but the difficulty is to induce the farmer to spare his sons for additional education after they have left school; and the only way, I imagine, in which he can be encouraged to do so, is the wholesome one of having a portion of the expenditure on the lad repaid him by his obtaining a scholarship, or some prizes which would support him either about some establishment, or in connection with some large farm. Now there is a want of all this; and it is one of the reasons why a committee of this society has been recently appointed. But in connection with the work of the committee, we must remember that its duties are limited to an inquiry into the manner in which the Royal Agricultural Society of England can assist those who are employed in obtaining their living from the land; and it cannot take up the whole question of the general education of the farmer as we can do to day in this discussion. This discussion, therefore, has nothing to do with the operations of the committee, although from what I know of the different members of the committee, I dare say they will, more or less, take the view I am advocating, and be very glad to make themselves acquainted with the opinions of the gentlemen now assembled. My views are these: that, following the example set in Devonshire, we ought to do our utmost, not as a society, but as members of the agricultural class, to establish a system of public schools throughout the country as opportunity presents itself; that whilst the farmer's son is reaping the advantage to be obtained from this system, we ought to give him encouragement by shewing him that if he will but exert himself, and bring out the talent that in him lies, he will gain honours and attain a status. And then, we ought to follow that up by enabling those who have gained such honours further to make themselves perfect in their profession, by having the advantage of attending where a scientific education is bestowed, or studying the practice upon a farm; and that only in this way can we as an agricultural body work until the time comes, as I hope and trust it will come, when from the benefits which have arisen to the sons of the occupiers of land, who have through their own and our exertions been enabled to obtain a better education, or an education from which they are now entirely shut out, agriculturists themselves will step forward and join us in the great work of improving the educational condition of the farming class of this country (Hear, hear). With these remarks I beg to open the discussion.

Sir EDWARD KERRISON, M.P., was sure they would all thank Mr. Holland for the able manner in which he had introduced this important subject—a subject that had been kept in abeyance much longer than it ought to have been by the Council of the Society, seeing that according to their Charter it was one of their functions to encourage the education of the agricultural classes. This, however, they had not hitherto done, except so far as the circulation of their *Journal* and the occasional delivery of lectures were concerned. Mr. Holland had mentioned the name of Mr. Brereton and his successful exertions. He (Sir E. Kerrison) had visited that gentleman's school, and had there seen the pupils, consisting chiefly of the sons of agriculturists, maintained and educated at a cost so reasonable as to be within the means of almost any farmer of a tolerably-sized occupation; and some of these pupils had since passed the only test hitherto existing for the middle-class, viz., the Oxford and Cambridge middle-class examinations. A conversation which he had had with Mr. Brereton led him to consider whether any efforts made for the improvement of the education of the middle-class should not be made in so general a way as not to be an education for particular sections of that class, such as the agricultural, but an education for the whole middle-class of the country (Hear, hear). For the remark made by Mr. Brereton was undoubtedly true, that in many instances the sons of farmers were desirous of going into commercial life, whilst the sons of commercial parents were often desirous of becoming farmers. Consequently the training in any school to be beneficial to all

should be general; for it was well known that there was no limit to the trade of the country, but there was a limit to the land; and although year by year, owing to increased knowledge and energy, the produce of farming might be augmented, yet they also knew that, except in a few instances where fresh land was brought into cultivation, farms could not be increased in quantity. On the contrary, the tendency of the present time, and he regretted it, was to do away with small farms, and thereby reduce the number of occupations open to the sons of agriculturists. For this reason it was the more necessary in any system of education they encouraged that the Council should be careful not to give prizes to those schools alone which represented the education of agriculturists. Many schools had been started on the public-school principle, which was the only one he thought for which success could be claimed. For what test had the upper classes, after their sons had been at a private school, but the test of a public school? Supposing the farmer to pay a sufficient sum for the training of his boy at a private school, and to be unwilling that the boy should undergo the test of the middle-class examinations, what incentive was there in a school of 30 or 40 boys to distinguish themselves, and fit themselves for a searching and very high point of examination? In larger schools the incentive to work was much greater, inasmuch as with a greater number of boys the prizes given, however small in value, acted as an incentive, and proved to the parents the amount of proficiency attained by their sons. He thought the Council of this society might also aid by allowing papers on agricultural subjects to be transmitted to competent persons of their own selection from different schools in the country, and to such as were worthy they might award a prize, or, better still, a scholarship. That would be a still further incentive, and at the same time be in accordance with the terms upon which their Charter was originally given to them. There was already a school at Lancing, in Sussex; another at Hurstpierpoint, where a still larger one was rising for a thousand boys. And there was also a school in Suffolk, with which he himself was connected, for which a sum of £14,000 had been raised by the voluntary contributions of the gentry, and which would be opened in October next. The school in Suffolk was designed for all classes, not agriculturists alone; and the great difficulty that had been anticipated was that the education it would afford would be so good that the higher class chiefly would avail themselves of it, instead of those for whom it was more particularly intended. If that were the case they would naturally require a further point of education to be attained, a better dietary, and so on, until the expense ran up beyond the ability of the humbler classes to pay. It had, therefore, been determined that the whole cost of board and education should not exceed £24 per annum, which he thought would bring it within the compass of all classes. Now, supposing they had 300 boys to deal with, they could afford to give for this money a far higher education than could a small private school. With the feeling that appeared to animate gentlemen in so many counties, where they were about to commence the formation of schools of this sort, the Council of the Royal Agricultural Society would be very wrong if they did not lend a helping hand to those who so proposed to make personal sacrifices for the sake of the farmers of this country. The Council here would not pretend to send inspectors to such schools, or go through forms of that description; but the papers sent up to their professors, who he had reason to believe would willingly give their aid, would impart the confidence to the farming class that so far at least as the particular school was concerned, whose pupil won the prize, it was teaching the boys as far as possible the elements of what practically they had afterwards to learn. It was difficult to know what to do with boys between 15 and 20 years of age, but as a rule they did not remain at school after they were 17. He thought therefore that previous to that time the province of the school should be to give them as sound and good an education as possible; then, supposing them to have learnt chemistry as a science, they would practically learn upon a farm, in the course of a few months after leaving school, infinitely better than if all the farms had been united to the college.

The CHAIRMAN: Is the £24 a-year to include all the expenses of the Suffolk establishment?

Sir E. KERRISON: All.

The Rev. PREBENDARY BRERETON said that last year it was a question whether his school could keep within the

estimate. It had now been going on for about four or five years. It began with two or three boys only, and there were now sixty. The terms were £20 a-year for boys under thirteen, and £25 a-year for those who were above that age; but this year the charge for the younger boys had been raised to £23, and that would make the average £25, the previous prices giving an average of £24. Last year the payments for the boys fell short of the expenditure by £51; but during the quarter just ended, the expenses had been more than covered by the payments; the latter amounting to £283, and the cost of board £248. All the other expenses last year for taxes, salaries, &c. came to £415, and at the same rate this year he calculated upon having a surplus of £145, or 3 per cent. upon the capital. The head master received £130 a-year, and was provided with a house to live in. Two under-masters had £40 a-year each, and their board was reckoned at about £20 each, being 40 weeks at 10s. a-week. The cost of the boys' board was 8s. a-week each. The head master had also assigned to him any profits that might remain over and above a dividend of 3 per cent. Of course, the boys were not clothed by the institution, and those who learnt Latin paid extra. Otherwise, the £25 a head covered all expenses. The food was as good as could be desired, and there was an undoubted inclination displayed by the higher classes to avail themselves of the benefits of the school; but the check upon this disposition was to keep the expenses down, and if boys came there who required a classical education and extra, to make them pay a higher rate. Since the commencement of the school, he had traced many of the boys, and found that a good proportion of them had turned to farming. At the outset he thought that practical farming might be connected with the school, but local circumstances obliged him to keep the farm altogether distinct. It was carried on, however, contiguous to, though disconnected with, the school, in the hope that some pupils would be glad to receive a special education there. As yet the experiment of the farm had not decided him whether it was desirable to combine it or not, though he adduced a pleasing illustration of the advantage of letting instruction in practical farming keep pace with the education given in the school. The result of the school was, however, very satisfactory, and he thought that if no accident happened to it this year, it would be able to show that it had been so self-supporting as to pay interest on the capital raised for the building, and provide for a scholarship in the school. For the raising of capital to establish other schools he approved of the principle of limited liability; and a strict examination of the accounts was sure to be a check upon the master and the matron. When there was a profit, the shareholders could of course do what they liked with it; but if they appropriated it to the augmentation of the master's salary, or as prizes or scholarships, as had been done in the school, all parties would be interested in keeping the expenses down, and there would be no danger of a regard for the commercial principle, and the desire of realising a good dividend inducing the proprietors to neglect the true interest of the school (Hear, hear). He could honestly confirm the statement of Sir Edward Kerrison that for about £24 or £25 a-year a good English education might be given; but a classical education equivalent to that of the upper classes could not be had for that sum, though it might include French to a certain extent and mathematics. The school had for two years sent its first and second-class boys to the Cambridge middle-class examination, and this year they had been sent to both the Oxford and Cambridge examinations, where some of them had passed with great credit to themselves, and generally it had been reported by the examiners with credit to the school. Replying to enquiries by Mr. Frere, Mr. Brereton also stated that it had been considered necessary to teach a second language in connection with our own, and for their commercial value French or German was preferred; but he could not say that the success had been so great. It was difficult to find a good foreign master, but that which was taught was a part of the regular system of the school, and was not an extra charge. Latin, on the other hand, was an extra, for which five guineas was charged, and there were from ten to twelve boys who paid for it.

Dr. VOELCKER said, that having been practically engaged in the education of agriculturists, and taken interest in their welfare, he wished to make a few observations confirmatory of the views expressed by Sir Edward Kerrison. In the establishment of schools, then, he would guard the

managers against the great rock upon which many establishments had split, namely, the attaching of farms to the schools. He was convinced that the practical education which was given on the farm to the small tenant-farmers' sons was much better acquired at home than upon a farm attached to a school. The farm, moreover, was an expense which fell heavily upon schools, and without it he believed, with some little care, schools could be made self-supporting. They required to be supported by the influential men of the county; and such support as Sir Edward Kerrison had suggested that this Society should give would be most appropriate and beneficial to such schools; but it was in vain to hope that anything like a good practical education could be given in any establishment especially set aside for the instruction of the farmer. It was impossible to instruct three or four pupils together in one business. Wherever there were a number of lads brought together, they would be sure to do anything but what they ought to do. In school they could be kept under perfect control; so also in the lecture-room; but that could not be done on the farm. The thing was practically impossible, to give to a number of young men instruction in classes upon a farm. It was well that there should be establishments for the sons of gentlemen and landed proprietors, who required to have an insight of the higher branches of farming; and a different kind of education illustrated by a system of farming that had been described, though not very appropriately, as "experimental farming." The sons of wealthy farmers required to be specially instructed in the great art of making experiments, and of deriving advantage from a more careful observation than was perhaps needful on the part of the small tenant-farmer, for the simple reason that the latter had not the means at his command of bringing into play a superior standard of education. At present, it was the small tenant-farmers' sons who experienced the difficulty of finding proper schools for their instruction, and the great aim should be in such schools to give rather a general than a special education. A lad who, up to his fifteenth or sixteenth year, was instructed in the elements which were usually taught in general schools, and in addition perhaps the elements of natural science, especially of chemistry, would, when occupied upon the farm, practically turn out a much better agricultural chemist, and a more careful observer of the facts of natural history, than the lad who was instructed with special reference to his occupation in the elements of a particular branch of science, such as chemistry or botany. What was needed was a good education in the elements of natural science; and in its chief branches it should be provided in these schools. This would be a very useful addition to the general plan of instruction; but anything like providing the means of giving what was usually called practical instruction on the farm he was convinced would in the end turn out a failure, and entail a great expenditure of money upon the managers of the institution.

PROFESSOR COLEMAN, with regard to the education to be derived from having large classes upon a farm, entirely agreed with Professor Voelcker, that there was a difficulty in commanding the attention of the students and making the instruction sufficiently personal to be of value. At the same time that much information might not be derived by students from the teaching of the farm, he could not admit. If success in practical farming depended so much upon local experience, and the practice depended largely on soil and climate, it would be absurd to suppose that instruction upon a farm, whatever its situation and soil, would fit the student to take charge of a farm and embark a large amount of capital upon it where the conditions were altogether different. But that much useful general information available for future development with reference to special cases was thereby conveyed, he did certainly believe.

Mr. WREN HOSKINS, having observed that Mr. Holland had done great service to the agricultural body and to the Society by mooted this subject, said that the question was one of which the Council had frequent reminders, and it could not be asserted that the Society had left it altogether unnoticed. But the truth was, that the subject of agricultural education was one that had always presented considerable difficulties, partly arising out of a sort of ambiguity in the expression itself, and partly from the nature of the class to which it was applied. With regard to the expression, "agricultural

education" might be taken to mean the education either of the farmers or their sons—two classes which Mr. Brereton had very wisely separated. But there was yet another consideration, which was the special education of a person for agricultural practice. If the question merely concerned the education of the son of the farmer, he should then agree that education ought to be general and not special, that he would thereby be better adapted for the practice to which he would afterwards have to apply his knowledge. His knowledge and his practice would be more analytical and intelligent in every way, and more conducive to his own advantage and the profit of others, than if he were merely brought up to it by an education of a special character. But the question brought before the Committee of the Royal Agricultural Society—the question that Mr. Holland probably intended—was rather larger than this. It was a question how far education might itself be so adapted and directed as to convey some special advantage to agriculturists as a class. Now that embodied a very considerable difficulty, because he was not sure whether they were right in speaking of farmers as a class at all. For how could they classify under one head a body of men extending from the occupier of thirty, forty, or fifty acres, up to the person who might be the owner of 2,000 or 3,000 acres, where he was absolutely farming himself without the assistance of any tenant-farmer? The class was, in fact, so extensive, that any attempt to legislate, so to speak, for such a class would be entirely futile, because the body to which the legislation would apply would require a hundred or more different modes of treatment. That which would apply to the rich man who was farming his own land, and this was now a rare class comparatively, would not apply to the smaller and poorer occupier. Need he remind them of Lord Macaulay's jermiad over the decay of the former class? And he (Mr. W. Hoskins) deeply regretted it, inasmuch as it had reduced the question of farming so much to a mere question of tenancy and the occupation of another person's land, which involved very different considerations, and did not go to the root of the improvement of the whole country, but rather to how a certain quantity of land should be treated in a manner the most profitable to the person who held it and during the period he held it (Hear, hear). But the question of education, if attempted to be applied to the wealthier class of agriculturists, would be regarded as almost a presumptuous interference, because they were well able to educate their own sons, and were assumed to be well educated themselves; the very separation, however, of that portion of the agricultural classes from consideration necessarily reduced the question to the education of the poorer class of farmers, who, Professor Voelcker said, must be the special subject of consideration. Now, there was a greater difficulty respecting the education of that class than, perhaps, of any other body of men in the country. This was, first, because they were so widely separated from each other, and so completely severed from the influence of education being brought to bear upon them individually, so very different were their circumstances from those of persons who lived in towns, or were more closely congregated together; and next, because the practice of agriculture—that was to say, constant occupation from six o'clock in the morning until six o'clock at night in the business of the farm—was so exceedingly detrimental to the exercise of the mental faculties during the remainder of the day. Unless, indeed, a portion of the early part of the day were cut and carved out, and absolutely devoted to the purposes of intellectual culture of some kind, the attempt to put books in the evening into the hands of persons who had been the whole day occupied upon a farm, a plantation, or an estate, was almost futile. They must, therefore, in their deliberations in the committee, and even at that moment, address themselves to this point—what were the means by which they could bring educational influences home to the farmers? Besides the establishment of schools, which had been practically and usefully discussed that morning, there was another important matter for the committee to consider, viz., how to bring to bear upon the home life of the poorer class of farmers, and particularly their sons, through the aid of this Society, the most powerful educational influences. When, after the death of Mr. Pusey, the discussions took place respecting the *Journal*, an opinion which found some favour was that of cutting up the publication into smaller dimensions, so that it should be more available for practical home reading, converting it as it were into a sort of "Half-hour with the best Agricultural

Authors." Thus it was hoped to bring before the agricultural mind, with little difficulty, subjects that would evoke and excite intelligence, in reference to the particular pursuit in which it was engaged. When he acted as a Juror during the International Exhibition, he remembered being asked by foreign members of the jury what was the amount of the agricultural produce of England? What were the particular productions of the east or the north of England? and a number of other questions which it struck him at the time no English farmer ever asked, and which he was afraid very few of them would be able to answer, particularly such as related to agricultural statistics. But to French, Germans, Austrians, Portuguese, Americans, and Canadians alike—to all he was obliged to return the humiliating reply that we had no means of ascertaining what was the agricultural produce of the country; and so surprised were these gentlemen, that they seemed to be really incredulous of the fact (Hear, hear.) He had alluded to this subject because it was one of the matters which he should like to see occupy the attention of the farmer and his sons, leading as it would to the question of what was the agricultural produce of other countries? He had often heard farmers who suffered from low prices speak of the quantity of foreign corn that was imported into the country; and they did so evidently without any knowledge of what was the best course for them to take under the circumstances, simply because they had no means of ascertaining what the resources of the world were in respect of the different kinds of grain, in barley as compared with wheat, or oats as compared with barley; what kind of climate was most suitable for barley or oats; and how far competition was likely to be greater or less in different kinds of grain. He had glanced at these topics because they were constantly spoken of by farmers in the markets, and in conversation with their landlords and each other, and he had remarked that farmers took a great degree of interest in them. He feared, however, that this society had not quite done its duty in bringing these subjects forward in a manner that would add to the enjoyment of their pursuit, although they were topics to which farmers would most readily address themselves. He thought something might be done by the Society in this respect through the medium of the contributions to the *Journal*, and the chemical and veterinary questions that came before the Society; for these were subjects upon which they were periodically put in possession of a certain amount of knowledge, and he was of opinion that that knowledge might be made more generally available, by its being disseminated amongst the agricultural schools in such a form that it would also reach the agricultural home, and thus materially assist in developing the intelligence of the farming classes. Most cordially did he hope that success would attend the labours of the committee of the Society; and he could not sit down without again tendering his thanks to Mr. Holland for having introduced this subject.

After a few words from Mr. Raymond Barker,

The CHAIRMAN, in returning the thanks of the meeting to Mr. Holland, to whom, he said, they were greatly indebted, not only for his lecture, but for having proposed a committee of the council of the Royal Agricultural Society to consider the important question of education, observed that he could not entertain a doubt that important results would ensue through the instrumentality of that committee (Hear, hear.) He, for one, should be extremely gratified if they felt it their duty to recommend some general practical plan upon the subject, and also considered it expedient to propose that some prizes should be offered by the Society for the most proficient of the pupils educated at the proposed schools. Mr. Holland had not stated how soon he anticipated the committee would make its report, and perhaps it would be difficult to carry into effect any practical plan during the present session. Still, if they had a report from the committee, it might be considered by the council, for such an important matter could not fail to excite very great interest and discussion. With respect to the cost of such institutions, it would, no doubt, be considerable; and whether it would be advisable and practicable to add some land to each of them would be matter for future consideration. Of course, if that were done it would greatly augment the cost, and suggestions had been made by various gentlemen with regard to the appropriation of the farmed property of the society; for example, instead of investing it, that it should be employed in some other way, in order to

enlarge the operations of those institutions. If it were to be appropriated to any purpose of the kind, he should certainly say that the best means of closing it would be to expend a portion of the funds for the establishment and support of the prizes and scholarships to be given as rewards to the pupils who most distinguished themselves. It had been truly observed, by Sir Edward Kyrle, that they could not increase the quantity of the acreage of the country. They could, however, greatly augment its cultivation; and he might mention that the other day he saw a letter from Mr. Hudson, of Castle Acre, a member of the Council of the Society, to Mr. Mechi, and dated December 5, 1863, in which the writer said, "You are quite right in saying that the lands of England are not much above half-farmed. Depend upon it there is not nearly enough capital employed upon them." In that opinion he (Lord Feversham) also concurred; and the difficulty undoubtedly was, to make sufficient manure or to obtain it at a fair price. But that the land might be more highly cultivated, and so rendered more productive, anyone acquainted with the matter must admit, and he hoped that one of the results of these institutions would be greatly to increase the fertility of the soil and augment its produce (cheers).

Mr. WELLS, in seconding the motion, observed that the preponderance of opinion expressed that day was rather against giving special instruction, either in the new or existing schools, for the education of the agricultural classes. He should be glad, however, to see the special education of agriculturists as far as possible promoted; and he thought without attaching farms to the schools or colleges such a special education might to a certain extent be imparted. Every farmer nowadays found himself obliged to dabble a little in science, and it was most painful to witness the amount of capital that was wasted in the country, owing to ignorance in scientific matters. If, therefore, the elements of chemistry and a rudimentary knowledge of the steam engine were specially encouraged in these schools, he considered that it would be a very advantageous thing. He should be glad to find, therefore, that the committee proposed some scheme that embraced rather a more special system of education for the agricultural classes than was furnished by the middle-class schools of the country.

Mr. HOLLAND said it was satisfactory to find that they were all agreed in one point—namely, that the basis of instruction for a well-educated Englishman, whatever his after profession, should be public and liberal, including all branches of natural science as well as mathematics. Having agreed in that, there would be no difficulty in the committee arranging how a certain portion of their work was to be done. Still, there was this difficulty, that after the lad quitted school, if he had to become a farmer, he must have practical knowledge, and that practical knowledge must be connected with science. Science and practice must go together, and the difficulty was how that was to be given to that very large and scattered class to which Mr. Wren Hoskyns had referred. The class might be narrowed by remembering that those who farmed their own land, or were occupiers of very large farms with ample capital, were more or less blended with the class above them. That, therefore, would diminish the number of those to whom they would have to pay attention; and if they looked to the small farmers, Mr. Brereton had marked out a limit, in his pamphlet on education connected with agriculture, and drawn the line at the holders of farms of from 300 to 500 acres, just to show that the object was to assist those who were not able from circumstances to take advantage of the institutions which were already in existence for the classes immediately above them. That difficulty was still staring them in the face; but he trusted that as the question of education had now been fairly mooted, they would not leave the lad who was intended to be a farmer in the lurch, after having assisted to give him the benefit of a good education, and perhaps encouraged and stimulated him by means of prizes in connection either with agriculture directly, or with the natural sciences, all of which were connected with agriculture, but that they would be able to hit upon some plan for aiding those who were obliged to gain a practical knowledge of their profession immediately after leaving school, and give them an opportunity of improving their knowledge in the sciences connected with their profession. The committee would go to work as soon as they possibly could; but, of course, he was unable to say when they would make a report (cheers).

WOOL PRODUCTION IN SOUTH AMERICA.

It has been our object to glance from time to time at the condition and resources of the various countries to which we are more or less indebted for supplies of the raw materials for our manufactures.

And we propose now taking a survey of the course of our wool supplies from the South American States, situated on the Atlantic. From Peru and Chili we get a few million pounds of wool yearly; but it is to the republics bordering on the River Plate that we must mainly look for increased supplies. The vast pasture lands of the Argentine Republic it is well known afford the greatest facilities for pastoral industry, and many thousands of persons are at the present moment profitably engaged in this pursuit; and though the importation of fine wool from these regions is even now considerable, it is certain in the course of a few years to be very largely augmented. In 1862 we received upwards of six million pounds of wool from the River Plate, of the value of £286,000.

Last year the direct importations were larger, the proportion being 15,000 bales, against 10,500 in 1862. But this by no means represents the extent of the wool production, because a good deal goes to France, Germany, and the United States. Thus in 1850, 48,766 bales of wool were exported from Buenos Ayres, which, at the value of £25 per bale, shows an aggregate of £1,219,150 for this State alone—in 1862-63 the export reached 66,795 bales and 1,829 bags. From a pamphlet recently published by M. Balcarce, the French Minister Plenipotentiary in the Argentine Republic, addressed to the President of the Imperial Zoological Acclimatisation Society of Paris, we gather some interesting facts respecting the production of wool and the development of sheep farming in the Argentine territories. It would seem that the first importation of good types of European sheep took place in 1813, when, through the exertions of Mr. Halsey, the American consul, and Mr. J. M. Labarden, a small flock of merinos of German origin was introduced. The benefit to be derived was, however, lost, as the animals were unfortunately destroyed by fire. No further movement was made in this direction until eleven years afterwards, when the then President of the Argentine Confederation, Senor Rivadavia, promoted the introduction into Buenos Ayres of 100 black merino sheep from Spain, and 100 English Southdowns. These were purchased by Messrs. Sheridan and Capdevila, and crossed with the pampas varieties. In 1826 the Government made renewed exertions to improve the stock, by numerous and judicious crossings of the breeds, and in 1830 a spirit of emulation was created among the breeders, owing principally to the indefatigable and intelligent solicitude of M. Juan Iannac and other prominent individuals, whose example and success encouraged numbers of their countrymen, and foreigners also, to embark in sheep-farming pursuits. The result was soon manifest in the appearance of the rich pasturages of the Argentine Republic of flocks of lack merino sheep of Prussian and Saxon breeds, which, as well as those of Spanish origin, have been so much improved, especially in respect of the fineness and quality of their wool, that they are now commonly preferred to all of the European descriptions. New varieties were successively introduced, but that of the Spanish merino has been brought to the greatest degree of perfection, and so increased in numbers that at the present time it represents a very considerable figure. The Saxon type allied to a breed produced by previous crossings has also

proved most prolific, and numerous flocks, more or less perfect, are now to be found grazing in the prairie pastures of the Confederation.

The unfortunate political vicissitudes to which these fine countries were so long subjected as a matter of course exercised a most adverse influence on the progress of this great movement. The insecurity of property paralysed exertion, and sheep-farming pursuits, in which for a time the "hacendados" had occupied themselves with considerable profit, were almost entirely abandoned. It was not until 1852, when peace and security were again restored, that this branch of industry revived, since which period it has steadily and rapidly acquired more imposing proportions. The persons who now possess from 20,000 to 40,000 sheep are too numerous for enumeration, and there are many with flocks of 50,000. M. Cascallares owns no less than 150,000, and M. Lazano, the largest owner, 250,000.

In addition to the immense flocks of the indigenous varieties, more or less improved by crossings with European breeds, there are in the Argentine republic now about 7,000 pure sheep of the Prussian and Silesian, and 1,500 of the Rambouillet, Mauchamp, New Leicester, and Southdown descriptions. The total number of sheep of all kinds at the end of 1863, in the province of Buenos Ayres, the great seat of this industry, was estimated at 27,000,000, and the actual money value represented may be conceived, from the fact that, while a breeding sheep of a good variety will sometimes fetch as much as 500 piastres, the average price of animals purchased for slaughter is about 45 piastres or dollars per head.

French sheep are not very highly valued by the sheep-farmers, being apt to degenerate; and English New Leicesters and Southdowns are scarcely held in greater esteem, because of the comparative inferiority of their wool, and the sterility of the ewes from excessive fatness.

In illustration of the rapid increase of sheep in this country, it is stated that the Merino Pastoral Society commenced operations with 106 ewes and 84 rams of the Silesian description, and 6,080 animals of mixed breeds. At the end of eight years they had 1,600 pure merinos and 80,000 mixed, while, besides this, the reproduction had more than covered the incidental expenses incurred.

In the quality of the wool the exertions for the improvement of the indigenous races have proved remarkably successful. Formerly the fleeces of the Argentine sheep were meagre and of inferior quality. Few of the animals on the average yielded more than 2½ lbs. per head annually. Now, however, by means of their alliance with European varieties, the fleece has acquired a superior quality. Although as much as 6 lbs. per head has been obtained, such results are exceptional, and when the average yield is 4½ lbs. the animals must be regarded as of superior quality. The nature of the soil and the quality of the pasturage have necessarily a marked effect on the production of the flocks. Animals which, when pastured on indifferent land, will only yield three pounds of wool per annum, two years after their removal to more favourable localities will furnish as much as four pounds. According to quality the prices of wool vary from 50 to 120 dollars per arroba.

In 1823 the value of wool at Buenos Ayres failed to cover the expenses incurred in its preparation for the European market. In 1829 the export only amounted to 30,384 arrobas; in 1837 it had increased to 164,706

arrobas; in 1851, to 190,600 arrobas. In 1856 1,627,428 sheep skins and 1,152,115 arrobas of wool were shipped from Buenos Ayres; and in 1862 2,285,064 skins and 2,286,840 arrobas of wool. An increase of nearly 23 per cent. is shown by this statement to have occurred in a period of seven years.

Further statistics are added by M. Balcarce to show the per-centage increase in the exports of wool from Buenos Ayres to the United States and the different countries of Europe:

	1848 to 1852.	1853 to 1857.	1858 to 1862.
Great Britain	14.443	17.835	10.273
France.....	12.225	20.461	27.508
Germany, Holland, and Belgium	7.954	30.774	39.784
United States	63.164	27.144	21.083
Italy	2.214	3.498	1.313
Spain	—	0.283	0.039
	100.	100.	100.

There can be no doubt that a few years hence the export of skins and wool will attain to still greater proportions. The national progress of the republic is in a great measure identified with the development of its pastoral resources, which so far has conduced in a signal manner to its moral and material advancement. The progressive and improving tendency of sheep farming is incontestable. It has caused the nomad population of the Argentine campos to take a grand step towards civilization by promoting the formation of active centres of population, by augmenting productive wealth, by creating new interests, and by these means establishing elements of order and stability. As wool-growing becomes more universal, these happy results will of course become more marked and permanent.

But it is not only to Buenos Ayres that we are to look for increased progress in sheep farming. Monte Video or Uruguay, as it becomes more peaceable, will extend its wool production. Our supplies from thence have trebled in quantity in the last six years. The southern provinces of Brazil could send us larger supplies. Colonization is extending in Patagonia, and there is ample room for the extension of sheep-farming there; while even the Falkland Isles may be made to contribute more wool.

ROYAL NORTHERN AGRICULTURAL SOCIETY.

THE CATTLE DISEASES PREVENTION BILLS.

A special meeting of the members of this Society was held on Friday, March 25, to take into consideration the Cattle Diseases Prevention and Cattle Importation Bills, at present before Parliament, and to dispose of a recommendation of the committee to petition against these bills as they at present stand. Sir Alexander Anderson was, on the motion of Mr. J. Ligertwood, called to the chair.

Mr. M'COMBER, Tillyfour, then moved the following resolutions (which were passed):

1. That this meeting recognise the propriety of having legislative enactments for regulating the traffic in cattle, with a view to prevent the spread of contagious disease, and for exacting heavy penalties against parties knowingly contravening these regulations.

2. That the Cattle Diseases Prevention Bill, lately introduced into the House of Commons, contains clauses which this meeting consider objectionable on principle and unworkable in practice.

3. That the meeting regard with strong disapprobation Parts 4 and 5 of this bill, which propose to commit to a vast number of cattle inspectors powers of an enormous and arbitrary character with reference to all the diseases specified in the schedule, including the mouth and foot complaint. The meeting regard this disease as one of frequent occurrence, of trifling nature, and of short duration. Were this bill to be passed into a law, a large proportion of the cattle of Scotland might at some seasons be subjected to its operation. The inspectors appointed under the statute would, at Falkirk market, where a hundred thousand cattle and sheep are exhibited, have power to condemn and bury every animal affected by the mouth and foot complaint.

4. That the meeting are of opinion that some of the clauses of the Cattle, &c., Importation Bill, lately introduced into the House of Commons, are highly objectionable.

5. That the meeting strongly disapprove of No. 1, Section 3 of that bill, which authorises "the examination of any domestic animals that may be imported by sea into any part of the United Kingdom from parts beyond seas, or be removed by sea from one part of the United Kingdom to another part thereof," on the ground specified in a memorandum indicating

the views entertained by the directors of the Highland Society, namely, that this clause proposes to "establish what may be considered an unfair distinction between the water and the land-borne portions of the home trade, subjecting the former to an inquisition from which the latter will be free, namely, an investigation at the port of arrival, and the possible destruction or detention of stock there." The meeting entertain the opinion expressed by the directors of the Highland Society in the document referred to, namely, that the result of passing this clause into a law would be "to divert the carrying trade from steamboats to railways, so far as the British trade is concerned."

6. That the meeting regard with strong disapprobation No. 3 of Section 3 of this bill, on the ground specified by the directors of the Highland Society in the memorandum referred to, namely, this clause proposed to "throw on the owner the whole loss and expense caused by the destruction or detention of his stock, however innocent he may be."

7. That this meeting approve of Part 3, Section 13, which proposes to enact that "every railway, canal, or other company or common carrier, that carries cattle for hire, within any part of the United Kingdom, shall, before putting any cattle into any truck, boat, or other vehicle, cause the said truck, boat, or other vehicle to be thoroughly cleansed; and the cases where there is reasonable cause to suspect that diseased cattle have been carried in such truck, boat, or other vehicle, to be disinfected by a washing of lime water, or some other purifying liquid.

The meeting are of opinion that the penalty specified in this clause, not exceeding one pound, proposed to be inflicted on any company or common carrier, making default in cleansing and disinfecting any truck, boat, or other vehicle, is much too small.

8. That this meeting approve of Part 3, Section 13, which relates to the supplying of cattle with water to drink at the least in every period of twelve hours.

9. That this meeting authorise a committee to prepare, sign, and transmit a petition, embodying these resolutions, for presentation to the House of Commons.

ROYAL AGRICULTURAL SOCIETY OF IRELAND.

The monthly meeting of the Council of this Society was held at one o'clock on Thursday, March 31st, at 42, Upper Sackville-street—Sir GEORGE HODSON, Bart., in the chair. The other members present were—Lord Cloncurry, General Hall, C.B., Hon. Thomas Preston, Hon. L. H. K. Harman, Robert Fowler, R. M. Carden, Leopold Cust, Major Scott, Phineas Riall, R. Chaloner, William Donnelly, C.B., M. O'Reilly Dease, Captain Colthurst Vesey, Hans H. Woods, J. Kincaid, J. M. Royse, Sylvester Bait, J. G. Coddington, J. S. M'Clintock, W. Fetherston, H. H. J. MacFarlane, Captain Thornhill, secretary, read the minutes of the previous meeting, which were confirmed.

PRIZE ESSAYS.—Captain Vesey, pursuant to notice, moved that "The finance committee, having recommended that a sum of £60 should be offered for prize essays on agricultural subjects—resolved, that a committee be appointed to carry the object into effect." Mr. Hands H. Woods said he had great pleasure in seconding the motion. Mr. Fowler said he would oppose it *in toto*. They do not want essays on agriculture at all, for they had plenty of them. They had got the Highland Society's Journal, and the Journal of the Royal Agricultural Society of England, containing essays, and there were a great many essays in the *Farmers' Gazette*. He thought it would be a great shame to spend £60 in the way proposed, and they had far better let it alone. Captain Vesey said there was great dissatisfaction in the country; it was said that was nothing but a show society. If the English and Scotch societies found it to be a very good thing to publish essays, he thought that was rather in favour of his motion. Besides, nobody could get these journals unless he was a member. Mr. Fowler said he got one through Mr. Curry. Mr. Woods said the society met once a year to hold a show, and after that they were not heard of; they should do something—get up evening meetings, or do something of the kind. The Hon. King Harman said the articles in the English and Scotch journals were principally written by practical farmers. He knew that considerable importance was attached to them, inasmuch as they set the farmers to work. Two or three of them got together, concocted a pamphlet, and the people believed what was true, because written by practical men; whereas if it were written by a landlord or a gentleman, the people would say the object was to raise the rents. Mr. Chaloner remarked that our climate was so different from that of England and Scotland, that it might be well to offer a prize to meet that very question. Mr. Donnelly said it appeared to be the general opinion of the council that something should be done in the matter. Hitherto the only objection to offering prizes was the want of funds. He was glad to find now that the finance committee took a cheerful view of the case, and that they were not only able to clear up their deficiencies, but were able to apply the sum of £60 for the purpose of giving prizes for essays on agricultural subjects. He suggested that a committee should be appointed to consider the matter, and report to the council, and he considered that it would be very desirable to do so. The Chairman said he thought the resolution of Captain Vesey embraced Mr. Donnelly's suggestion. Captain Vesey said that Mr. Donnelly went farther than he did. His resolution involved instructions to the committee, and he had no objection that those instructions should be added to his resolution. The motion was then put, and carried unanimously.

THE TWENTY-FIRST RULE.—The Chairman drew the attention of the council to the following notice of motion, which had been placed on the paper by Mr. Phineas Riall:—"I will, on Thursday, 31st of March, move that the twenty-first rule of the Royal Agricultural Society of Ireland be amended, by adding to the said rule, save and except such matters as may relate solely to agricultural interests." He said the matter was a very important one; it was the subject of rescinding what used to be the 14th rule, and which was now the 21st rule, which related to the society discussing any question before either house of parliament. Many of them would remember the abolition of the 14th rule, which was

carried by Mr. Roper some 16 or 18 years ago, and which very nearly resulted in the dismemberment of the society (Hear, hear), and led to the retirement of the Duke of Leinster and others. It was very difficult to know where the line should be drawn, under the unfortunate circumstances of this country. Mr. Riall said it was the apparent anomaly involved in the case that suggested to him to propose as an addition to the rule the words which he had inserted in his notice of motion, to exempt from the operation of that rule matters solely and entirely connected with agriculture. Since then he had thought over the matter, and spoken to several people, and from his own ideas, and the opinions which he had received from others, he thought it better to withdraw the notice of motion (Hear, hear). The Hon. King Harman said he thought it was a pity that an agricultural meeting in Ireland could not discuss those questions which were discussed by the societies of England and Scotland. Eighteen years ago was a long time, and perhaps they could not then have met at that green table without one-half of them fighting with the other half (laughter); but, thank God, they were now in 1864, and things were different. There were a great many members of parliament who knew nothing about agriculture; and where were they to get information, except from the society? The Highland Society had been up and active on the cattle disease prevention bill. Mr. Scott: You cannot even discuss the question without first rescinding the rule. Lord Cloncurry said that he had been so seldom in attendance during the last few years, that he felt hardly justified in giving any opinion upon the subject; but he confessed that he thought it a matter of deep regret, and a great loss to the farming interest and the public at large, that a consolidated opinion could not go forth on purely agricultural subjects. He could not understand the difficulty of drawing the line between subjects that were calculated to excite strong opinions and between matters that were connected purely with agriculture. Last year there was a bill before parliament—the Weights and Measures (Ireland) Bill—and hon. members would have been greatly assisted by the expression of an opinion on the subject. When anything like that was pending in parliament, if the society could form a committee to examine the provisions and the clauses *seriatim*, and draw up a resolution to be sent to the members who had charge of the bill, it would afford information, and be of vast importance to the public. The hon. gentlemen who had charge of the Cattle Disease Prevention Bill had written in various directions for information on the subject, and if they had a document in their hands that would be entitled to respect, emanating from a committee that represented every part of Ireland, it would be a great benefit. There was a feeling in the public mind that the society was of very little value, because they were so "touchy" on that subject, and as if they were afraid of each other. At the time, for instance, of the corn law agitation, it was desirable that the rule should not be tampered with, when opposite opinions ran very strongly; but there was nothing of the kind now; besides, the consideration of the present bill would scarcely come under the designation of "politics." The Chairman said there was no question more intimately connected with agriculture than the subject of "tenant right" (Hear, hear); and if some one gave notice for the discussion of that question, could he or any other chairman refuse to entertain it? Mr. Cust said that if a question arose about weights and measures, public drainage, &c., the society was the proper party to take up the subject. If they could frame any rule that would enable them to be more useful, it would be well. Mr. Royse said the rules of the Farmers' Club permitted them to come together and discuss agricultural bills before parliament. A horse committee had been formed outside that society; and he thought it might be of importance if a committee were appointed to consider the present subject in the same way. Major Scott said such a committee could not be appointed under the rule. Mr. O'Reilly Dease said that Ireland was exclusively an agricultural country, and therefore almost everything connected with land was, to a

certain extent, a party question. After some further conversation, the subject dropped, Mr. Riall having previously withdrawn his notice of motion.

FLAX CULTURE.—The following letter was read in connection with this subject:—

“Dublin Castle, 30th March, 1864.

“Sir,—I am directed by the Lord Lieutenant to acquaint you, for the information of the Council of the Royal Agricultural Society of Ireland, that the Lords Commissioners of her Majesty's Treasury are prepared to place at the disposal of his Excellency a sum of £2,000, to render such assistance as may be considered most conducive for promoting the cultivation of flax in the south and west of Ireland; and I am to request that you will move the Council of the Royal Agricultural Society to communicate with the Royal Dublin Society, and submit for his Excellency's approval the arrangements which appear best suited to give effect to the wishes of the government, and also that they will name the districts which the societies respectively propose to undertake.

“I am, sir, your obedient servant,

“Thomas A. Larcom.

“Captain Thorahill, &c.”

After some consideration, the following noblemen and gentlemen were nominated a committee to confer with the Royal Dublin Society, and report upon the subject:—Lord Clancarty, Lord Clonbrock, Col. Knox Gore, Leopold Cust, Denis Kirwan, H. J. MacFarlane, Joseph Kincaid, and General Hall, C.B.

NEW PATENT MILL.—Captain Thorahill exhibited a most ingeniously constructed machine, termed “Carr's Patent Levigator Mill; or Pestle and Mortar superseded.” The mill consists of one or more edge runners, worked in a pan, which forms the bed-plate. Both runners and pan are caused to rotate in the same direction, but with unequal velocities; and the effect of this is the development of an unusually large amount of reducing or triturating power. This machine (for the sale of which Messrs. White and Co., 23, Westford-street, Dublin, have been appointed agents) is well adapted for the grinding of furze, straw, bones, and a great variety of other matters used in agriculture. It appears to have attracted a large share of the attention of scientific men on the other side of the channel and in France, on account of the great economy and concentration of power which it effects.

NEW MEMBERS.—The following were balloted for, and duly elected:—Nathaniel Montgomery, Esq., J.P., Cullin, Co. Cavan; Henry Owen Saunders, Esq., J.P., Berrisokane, Co. Tipperary; John Molloy, Esq., J.P., 2, Great Denmark-street, Dublin; George Evans, Esq., Portrane, Donabate; Francis Wakefield, Esq., Broomfield House, Ashford; John Wallace, Esq., Nasgor, Clondalkin; Richard A. Gray, Esq., C.E., Clonliffe Parade, Fairview; Richard Walsh, Esq., Kingwood, Saggard; George Pountet, Esq., J.P., Enniskerry; John Lanigan, Esq., M.P., Richmond, Templemore; Patrick Hugh O'Connor, Esq., D.L., Dundermott, Castlere; Henry Cusack, Esq., Abbey Villa, St. Douglough's; Lord James Butler, Drumcondra Castle; Captain Henry Lee, J.P., Longford. The meeting then separated.

BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

The usual monthly meeting of the Council was held at Douch's Railway Hotel, Taunton, on Saturday, April 2. Colonel Acland presided, in the absence of Earl Fortescue, from whom a telegraphic message was received announcing an accident which had caused him to be too late for the train.

THE BRISTOL MEETING AND H.R.H. THE PRINCE OF WALES.—It was resolved by acclamation that the Right Hon. Lord Fortescue be requested to put himself in communication with the authorities of the city of Bristol for the purpose of inviting H.R.H. the Prince of Wales, the patron of this society, to honour the approaching exhibition with his presence, and to make such arrangements as he may deem best for carrying out so desirable an object.

THE CONTRACT COMMITTEE, through Dr. Gillett, announced that they had accepted the tender of Mr. Keene, of Bristol, for the supply of refreshments at the Bristol meeting.

ELECTION OF MEMBERS OF COUNCIL.—On the motion of Mr. Jonathan Gray, it was resolved that at their next meeting, on the 7th May next, the council do prepare a list of members of council to be recommended to the annual meeting for election, in the place of those whose term of office will have then expired.

TERMS OF MEMBERSHIP.—A long discussion ensued on the privileges of members, and the desirability of inducing an increased scale of subscription among those who, from misapprehension, now contribute only on the lowest scale permitted. A resolution of which notice had been given on the subject was withdrawn, in the hope that members would take spontaneous action in the matter.

SELECTION OF JUDGES FOR THE BRISTOL MEETING.—On the motion of Mr. Knollys, it was resolved that the secretary be desired to apply to the secretaries of the national and county agricultural societies (named in the resolution), requesting them to furnish lists of gentlemen qualified to act as judges for the several descriptions of stock for which prizes are offered by this society.

THE OPEN JUDGING OF STOCK AT BRISTOL.—A code of rules for the regulation of the open judging at the Bristol

meeting was brought up by Mr. H. Fookes, and carried unanimously. It was among other things resolved that the judging shall commence at 10 o'clock on Monday morning, at which hour the public will be admitted to the show-yard; and it may be stated in general terms, that the rules for judging are with very slight modifications the same as those adopted at the Worcester meeting of the Royal Agricultural Society. On the motion of Mr. John Gray, seconded by Mr. Knollys, it was resolved that, in event of an animal to which a prize has been awarded being disqualified, the animal next in merit (unless disqualified), shall succeed to the vacant prize, unless certified by the judges to be of insufficient merit for a higher prize than that which has been assigned to it; and, that the judges be requested to hand in one or more “reserved numbers” of animals which shall succeed in like manner. It was further resolved that the veterinary inspector do accompany the judges when the classes of horses are judged, and advise the judges, before they make their awards, of any disqualification affecting the animals selected for prizes, and that in all other classes he be sent for by the judges before they award the prizes in any case of doubt.

THE ENTRANCE FEE FOR HORSES in classes 39 to 50, inclusive, was fixed at £1.

THE SHOW-YARD AT BRISTOL.—In consequence of a letter received from Mr. Widdicombe, who is still an invalid, it was moved by the Rev. T. Phillpotts, seconded by Mr. G. S. Poole, and resolved that the steward of the yard (Mr. John Gray) be requested to confer with and assist the director of the show-yard or his deputy for laying out the ground, erecting the buildings, and making the general arrangements at the forthcoming exhibition.

NEW MEMBERS.—The following were elected as members:—Messrs. Charles Ballance, Taunton; Geo. Tucker, Ipplepen, Newton Abbot; G. Lockyer and Sons, St. Philips, Bristol; W. Long, Sandfarm, Dodington, Chippenham; John Wigmore, Bickerton Court, near Ross, Herefordshire; James Bennett, Ingestone, Ross; Mr. Wm. Stallard, Brockhampton, Ross; and John Albert Hollins, How Castle, Ross.

AGRICULTURE IN CHINA.

Among the various consular reports recently published by the Foreign Office, we find in an elaborate one by Mr. Acting-Consul Gibson on the trade of the district of Tien-tsin (near Peking), some interesting details on the agriculture of the northern part of the empire, which do not speak so favourably for the energy and industry of the natives in that metropolitan district as we have been always led to entertain. The agricultural productions here are very inferior, both in quantity and quality, to the produce of the central and southern provinces of the empire. The following sorts of grain are generally cultivated—wheat, millet, barley, peas, Indian corn, and rice. The price of rice, most of which is imported from the south, regulates the grain market. Wheat, which regulates prices with us, is in China of comparatively little importance. The market prices of the different kinds of grain cultivated are given as follows: Wheat 3½ dollars per picul (133½ lb.), buck-wheat 2½ d., bearded wheat 1½ d., barley 1 l-10th d., white and yellow millet 1½ d. to 2 d., green peas 2 d. to 2½ d., hempseed 3½ d., Indian corn 1½ d., rice 5½ d. per picul. Wheat is not extensively grown in the north. The two varieties most common, however, are winter wheat (*Triticum hyburnum*), and bearded wheat (*T. turgidum*). Spring wheat (*T. aestivum*) is scarce. The soil in most places is too light for wheat. An acre of land yields from 25 to 50 "quarters" [bushels] of wheat, according to quality. The word *quarter* is printed throughout the report, where *bushel* is evidently meant. Millet is very extensively cultivated in this district. There are numerous varieties; but the kaoliang, or Barbadoes millet, is the most common. We do not know what species of millet is here meant, unless it be the guinea corn of the West Indies (*Sorghum vulgare*), which would scarcely seem suitable to the climate of Northern China. The light sandy soil is said to suit this species of millet. The average yield is about 1,200 lbs. of grain to the acre. The poor people live on millet to a very large extent. A highly intoxicating beverage is made from fermented millet, which is in extensive use in this and other districts. The stalks of the Barbadoes millet contain a great deal of woody matter, and are much used for fuel. Fences are often constructed of them. Barley is not uncommon. The yield on average land is 1,400 lbs. of grain to the acre. Indian corn is extensively grown in the neighbourhood. The grain is generally ground into meal, and largely consumed by the poorer classes. An acre of indifferent land will yield about 800 lbs. of Indian corn; an acre of good land double that quantity.

This district is not suitable for rice cultivation; nevertheless, in certain localities rice is grown. It is, however, very inferior, both in size and colour, to the rice imported from the south. An acre of ground yields about 1,200 lbs. of rice. Peas are largely cultivated in the district. The produce is about 1,600 lbs. to the acre. There is a large local traffic in this pulse, and a small quantity is exported. In 1862 86,456 piculs were shipped, and 12,924 piculs of bean cake. Vegetables are also largely cultivated. The "pait-sai," called by foreigners the Shantung cabbage, excels in flavour, although not in size, any English vegetable of the same class. Its price in the market is about 0½ d. per lb. Paraley and turnips are spoiled in the cultivation. The carrots and sweet turnips are uniformly good. The arrow-root plant is cultivated in the south-west part of the province. The fecula made from its tubers is palatable, but coarse and dark-coloured. The potato of Europe is grown successfully in this district; it exhibits no symptoms

of disease, and sells at the rate of 5s. per picul. Many other sorts of vegetables abound, but those enumerated are the most common; all, however, are equally cheap. Mustard is largely cultivated. The flour is very strong and pungent, but coarse and dark-coloured. Rhubarb is grown for its medicinal root, and about 264 piculs were exported. Fruit of all kinds to be met with in a temperate climate is plentiful and cheap, but it is deficient in flavour as compared with English fruit. The apples and pears are flavourless. The peaches are bitter, but the natives generally pull them before they are ripe. Walnuts, chesnuts, and date plums abound. The grapes are remarkably good. Three varieties are common in the market, viz., 1st, a very small round grape; 2nd, a very long grape, rather sweet to the taste; and 3rd, a full round grape, which tastes a little tart. In autumn all the three sorts are very cheap.

Most of the live stock comes from the so-called desert of Gobi. The native horses are small and ugly, but remarkable for their quality of endurance. Their height is about 12 hands, head disproportionately large, ears long, neck short and massive, chest broad and ample, body short, legs strong and sinewy. The native horse requires no attention, or rather receives none. He eats anything and lives anywhere. A good native horse costs about £5 at Tien-tsin, but in the plains where he is reared only about £1 10s. Hay can be bought in the market, but it is very inferior stuff. The food of horses consists generally of hard innutritious chopped straw, mixed with millet, Indian corn crushed, or barley. The cattle, in common with the horses, come from Gobi. There are two kinds—the one large and somewhat coarse, the other small and fine. The large breed resemble much, at a little distance, the Highland bullock; the small breed are generally spotted red-and-white, and are not unlike the Ayrshire breed. The beef exposed for sale in the markets is good. Its quality might, however, be improved by better feeding and treatment; but the Chinese understand nothing about the rearing of stock. Beef costs in the market about 2d. per lb. The sheep also come from the desert of Gobi. The breed sent down from Mongolia is almost always the large long-eared broad-tailed sort. The Mongolians have another much finer breed, but they do not find their way down to Tien-tsin. The quality of the mutton is good, but, equally with the beef, might be improved. It costs in the market about 2½ d. per lb. The breed of pigs is improved. Pork is abundant, but of bad quality. This is entirely owing to the fact that the pigs are not properly fed, their food consisting of anything they can pick up—no attention whatever is paid to them. The fowls are large, abundant, and cheap. Ducks and geese are reared in great numbers, and the market is well supplied with them at a cheap rate. The population is large, but the means of living are abundant and cheap, and there is much less destitution in this than in many other far richer districts of the empire. The people of the district are mainly employed in agricultural pursuits. Probably there is not a single wealthy family (in the English acceptation of the expression) in the whole of the neighbourhood. The wholesale division of property which ensues upon the father's death among the different members of his family, partly accounts for the general poverty of the Chinese; but it is no doubt owing still more to the bad civil administration under which the people live. The natives generally content themselves with the acquisition merely of a

moderate subsistence. If with small exertion they are able to secure sufficient for their daily wants, they gladly avoid those extraordinary efforts of perseverance which ensure the accumulation of a fortune; not because they are an indolent people, nor because they do not appreciate the conveniences and luxuries which wealth commands, but because this wealth would be certain to lay them open

to the extortions of the officials, with all the troubles which these involve. The Imperial Government, it is true, taxes lightly; but the rapacity of the civil officers discourages the accumulation of wealth in private hands, by subjecting its possessors to unmitigated oppression and spoliation.

THE MODERN PRACTICE OF GRAZING.

It is my intention to offer but a very few remarks upon this subject, because I wish my paper to be more of an inquiring or suggestive character than otherwise. The great object with our best graziers is to get off as much fatted stock as they possibly can in every season. Hence, they buy largely and feed liberally, if not profusely. The grazier is, of course, the breeders' customer: his aim is to buy as cheaply as markets will warrant—the breeder to sell as dearly. Thus we have a continual strife between the two classes. For the past three years the breeders have had a decided advantage. That great material for manufacturing industry—*wool*—has continued for that period to advance in price; and thus it has been the guide, or rule, upon which the price of all farm stock has been sold.

The grazier has, of course, to decide which will best answer his purpose—to graze cattle or sheep—and acts accordingly, taking into due consideration the adaptation of his land. *Bullock land* and *sheep land* are sufficiently expressive terms to indicate for what order of grazing they are best adapted. But as there are so many lands that may be made applicable to each order of grazing, although not in such perfection, yet it is the stocking of these lands that rules the markets. Should sheep be relatively the cheapest, they are stocked with sheep; but if cattle are cheapest, then they are stocked with cattle; and so the prices of each kind of farm stock become assimilated.

Well, the spring is again at hand, and graziers have commenced making their purchases, the breeders still having a decided advantage, prices ruling very high—in fact, too high for ordinary grazing to yield any profit. Hence graziers are compelled to resort to artificial management in promoting the progress of their stock. This is what I mean by "The modern practice of grazing." There are but few graziers now to be found who do not resort to artificial means for fattening sheep and cattle. Immense quantities of cake, corn, and meal are now consumed by grazing stock upon their pastures. It has become a common practice; but the immediate profit is not yet apparent. Ultimately lands thus grazed will produce more grass, and that of more nutritious quality; but the first cost of feeding is not always repaid. One great fact is, that they cost too much money. This is true, unquestionably; but who is to be blamed for that? graziers, certainly. They go to market or fair. Once there, they will buy, be the price what it may. And it is singularly true, that this order of dealing lasts much longer than circumstances appear to warrant. It is not for some years that a change takes place. Graziers find that year after year they are grazing stock without profit, and this opinion grows stronger and stronger annually, till the impression is general—"We must buy things lower" becomes the universal language of graziers; but it has been a long time ere that view has been arrived at. Then comes a change as much the other way. Store and other grazing stock become depreciated in price, the graziers

get their turn, and the breeder is the sufferer, and this change again lasts disproportionately long.

It may be said that supply and demand is the grand rule for price. No doubt it is commercially, but it is not by any means the rule in agriculture. It is more as I have put it. Indeed, both graziers and breeders are equally in the dark as to the probable amount of the supplies of stock, or the demand for them. A good system of agricultural statistics would do much to dissipate this ignorance. Surely we shall not be long without this being given to us. The only guide we now have is the comparative numbers of cattle and sheep exhibited for sale in our respective fairs.

At Lincoln fair, for instance, there will be from 30,000 to 45,000 sheep exhibited. The difference in this supply will, of course, have its effect upon the fair; but no one knows before the time what the number is likely to be. Nor does the supply at one fair suffice for a guide to the next: much depends upon the season and the quantity of keeping on hand. If the latter is all gone, such facilities for transit are given by railways, that large quantities of stock are brought from remote districts to make a large supply. The grazier, then, is without any definite guide; he therefore speculates; he buys what he requires, and endeavours to make the best of it, the chief resort being, as I have said, to artificial foods. Now, the great question here is as to the extent to which it is prudent for a grazier to go, in administering such food to his stock. Two cases occur to me as the practice of two graziers last year, one a grazier of cattle, the other of sheep. The cattle grazier had a large field of most excellent and rich grass: to this he put his best and forwardest cattle, giving them from eight to fourteen pounds of cake daily. They progressed rapidly, and as they were fatted off others in progression took their places. In this way many were "got off" early and left a profit, but the latter-fed ones were with difficulty disposed of to any good result. The sheep grazier adopted a like practice as to feeding with his sheep; but as they were chiefly hogget sheep, and designed for grazing and turnip fattening, he did not succeed so well. The sheep were exceedingly good of their kind. Their rations were a liberal allowance of peas besides cake, and during the past winter up to the present time the allowance became one pint of peas, besides (if I was told correctly) half a pound of cake daily. A most liberal diet certainly. The sheep progressed admirably, but the grazier told me they did not leave a profit. These I consider excessive cases. No bullock, however large his size, can profitably assimilate or take into his system fourteen pounds of good linseed cake daily on a good grass pasture; nor can a hogget sheep, or even when he is advanced to a shearing, take into his system with profit one pint of peas and half a pound of linseed cake daily on good grass. The quantity is too much for promoting their safe and satisfactory progress in both cases. It will be seen from these two instances, both carried out in a truly business-like way, that artificial foods may be given without any sufficient

return for such liberal management. What then is the grazier to do? He must buy his stock in cheaper. There must not be this "hand over head" way of doing things. It is better to defer to the last the purchase of stock rather than to buy in so foolishly as to risk all chance of profit. There ought to be more consideration on the part of both breeders and graziers. They are mutually dependent upon each other, and profit, in truth, ought to be fairly divided between them. But go into the market, take things as they are: if the grazier won't buy, the dealer will; he has various commissions to fulfil. The prices are

set, you must give them or go without; and it is only, as I have said, the work of a considerable time before a change—a thorough change—takes place, and then it is as much on the contrary side as was the other, and for no better reason. The great fact is, that the public mind is slow to change. If it gets fixed upon any one idea, or course, or impression, no matter upon what subject, it is almost impossible to reverse it. It is therefore probable that our graziers must continue to "burn their fingers" till some unforeseen catastrophe shall at once pull them up.

P. F.

SALE OF THE SARSDEN HERD.

This extensive herd of Shorthorns, which has for some years been so distinguished in the Oxfordshire show-yards, and has also come well to the front of large bull classes at the Royal English Agricultural Society, with its Royal Turk and Lord of the Harem, was dispersed by Mr. Stratford on Tuesday, March 22. There were 115 lots originally in the catalogue (which had a capital index to it), but they were swelled to 121 by four fresh heifer and two bull calves, after February 11th, one of which the aptly named "Crisis" from Cocoa, arrived on the Saturday before the sale. The late Mr. Langston, who was for some time master of the Heythrop, began his herd with five-and-twenty purchases in the North of England, and many of the shorter pedigrees end rather abruptly, with "a cow bought in the North of England," "in the county of Durham," "at Hexham," "in the North," and so on. The Daisy tribe, of which there were 21 in the catalogue, sprang from Helen by Blyth Favourite (801), whose great grand-daughter Roan Daisy, had twins thrice in succession, and thirteen calves in all. Helen and Juvetus were both by a son of Wellington, and the Silky tribe goes back through Champion by Vagabond (9765) and three Silvers to the sound old "Jobling sort." Charmer by 4th Duke of York from Chaplet (a daughter of old Chaff), was bought with her dam for 54 gs. at the Tortworth sale, from whence also came Louisa (65 gs.), in-calf with Lucy Long by Duke of Glo'ster (11382), whose tribe consisted of nine besides herself. Coquelicot by Duke of Cambridge (12740), from an Earl of Dublin dam, was a 92 gs. purchase at the Fawley sale, and said to be the baronet's "pet calf." The herd has also been strengthened by Cordelia and Cornelian from the Milcote sale, and they were knocked down—the one for 42 gs. to Mr. G. C. Adkins, and the other for 80 gs. to Mr. G. Graham, Warwickshire. Among the principal bulls we may note Prince (4772), Cornforth of Barforth's blood, Splendour of the old Jobling sort again; Lockaley, which brought in a strong dash of Arbuthnot's Pink by Caliph; Vagabond by Duke of Cornwall (5947), from a Ducie cow, and the sire of Champion, one of the best prize cows that has ever been in Oxfordshire; Lord Milton by Laudable, and more especially Glo'ster's Grand Duke, a grandson of Duchess 59th, and bought by Mr. Hall, the late master of the Heythrop, in the dam's belly, at Tortworth. Archduke 2nd from Captain Gunter's made one great season, and only got one calf, Royal Arch, during his second. There were only twelve of his stock in the sale, and they averaged 255 16s. 6d.; twenty-three by Royal Arch from Countess of Glo'ster's Grand Duke averaged 237 8s.; Royal Turk was credited with twelve at £47 5s.; and Lord of the Harem with twenty-five at £38 1s.

The attendance was calculated at about 2,000, and the herd was dispersed into some fourteen or fifteen counties,

and Ireland as well. The five years and a-half Lord of the Harem, who was bred by Mr. Housman, of Lune Bank, and has won numberless prizes at Oxford, Gloucester, Stowe, Banbury, &c., besides his Royal second and H. C., was brought out on parade in the course of the morning, and was very much admired, and set at a much higher price than he ultimately fetched. Lunch was laid out in the girls' schoolroom, and the doors were thoroughly besieged. For the first hour the visitors were admitted by tickets; but the external pressure and the internal cravings, produced perhaps by the keen air, were too much for the feelings of many to whom a plate of beef is a much higher consideration at sales than the advancement of pure Shorthorns. Hence the ticket-collector was swept away, and the entrance, and the victuals with it, were fairly carried by storm.

The largest buyers were Mr. J. Bulteel, of Ivy Bridge, Devonshire, who took five lots; Messrs. J. P. Smith of Worcester, F. Lency of Kent, and Noakes of Lewisham, each went in for four, and Mr. J. P. Foster, of Kilhow, Cumberland, for three. The latter gentleman bid spiritedly at Towneley, but got nothing; and Mr. Freeman came on from there flushed with triumph, and finding no Mr. Eastwood against him, took off the top lot—Lady Louisa, by Archduke 2nd from Lucy Long. Lord Sudeley gave 60 gs. for Archduchess, of the Chaplet sort, and by the same bull; and Earl Howe 33 gs. for Turk's Pride.

Nine of the Silky tribe averaged 237 13s. 8d., and the highest-priced one—Queen of the May, by Lord of the Harem—was bought by Mr. Aylmer. Lady Louisa (100 gs.) was the queen of the Lucy Long tribe (which showed a return of ten, at £49 0s. 8d.) Her own sister, Lady Best, does not follow her to Preston Hall, but wends her way to Mr. D. R. Davies, near Knutsford, at 82 gs. Dandelion by Glo'ster's Grand Duke (Mr. J. Anderson, of Waterford), and Turk's Darling by Royal Turk (Mr. J. P. Foster, of Kilhow), were bracketed head, at 76 gs., of the *twenty-one* Daisies, which made 226 16s.; and Careless by Royal Turk (Mr. T. G. Curtler, 55 gs.) was the highest of *six* Comelies, at 237 16s. Pride of the Harem by Lord of the Harem (Rev. A. Riddle, of Stroud, 78 gs.), and Ancient Druid by Turk's Guarantee (Mr. T. G. Curtler, 55 gs.), headed the *five* Cherries, and brought up their average to £50 8s. The Sylph tribe were rather short in numbers, and the *six* made up their average of £48 2s. 6d., entirely through the aid of Cornelian, by Mameluke (80 gs.), and her daughter, Pride of the Mount by Lord of the Harem (Mr. J. T. Noakes, 70 gs.). My Lass by Glo'ster's Grand Duke (Mr. J. P. Foster, 58 gs.) was the head of the Meretrix tribe, which averaged 233 12s. for *six*. Cream by Young Weathercock (Mr. J. P. Smith, 55 gs.) was the well-named *prima donna* of the milking Crocus tribe, which was *twelve* strong, and went at £52 10s. all round.

The Coquelicots showed well, with *nine* at £55 10s. 8d. Old Coquelicot herself went at 60 gs. to Mr. J. Boyd in Essex. Mr. Saunders of Nunwick, whose nephew, Mr. Parker, showed the hereditary taste for shorthorns at Towneley, bore off her daughter Cocoa by Glo'ster's Grand Duke (a bull who has been a rare friend to Mr. Savidge); another daughter, Archduchess of Cambridge by Archduke 2nd (80 gs.) went with her to Mr. Boyd's; her Royal Counsellor by Royal Turk (56 gs.) was knocked down to Mr. T. Hall, of Water Eaton; her Thorndale's Grand Duke by Royal Turk (71 gs.), to Mr. C. Stubbs, of Penkridge; and her Pride of Sarsden, by Lord of the Harem (55 gs.), to Mr. Tait of Her Majesty's Home Farm. There were three from Cocoa, to wit, Chief Judge by Lord of the Harem (Mr. Judkins, 24 gs.), the three days' calf Crisis by Royal Arch (Mr. Woodward, 17 gs.), and his full brother Sir Charles, which was purchased by Mr. H. Webb, of Steely Hall, for 40 gs.

The Chaplets mustered very strong, and *thirteen* of them averaged £55 8s. 2d. Among them were Roan Duchess by Glo'ster's Grand Duke (Col. Lindsay, 96 gs.), and the second highest price at the sale; Lady Charmer by Archduke 2nd (Mr. Style Rich, 71 gs.); Royal Charmer by Royal Turk (Mr. Noakes, 62 gs.); Columbine by Lord of the Harem (Mr. F. Leney, 61 gs.); Blushing Pride by Royal Arch (Mr. Druce, 63 gs.); Archduchess by Archduke 2nd (Lord Sudely, 60 gs.); and Church Warden by Lord of the Harem—according to Mr. Savidge, "one of the very best ever bred at Sarsden"—(Mr. C. S. Hudson, 55 gs.). Royal Arch 2nd by Royal Arch, from Lady Charmer, was such a tempting double union of his beloved Charmer and Duchess blood, that his old guardian gave 66 gs. for him in conjunction with Mr. Cradock, and indorsed his truly masonic principles in the building up of shorthorns.

Turk's Delight (98 gs.) was bought for Canada by Mr. E. Hetherington; and Pet by Seventh Duke of York, from Pride of London, by Janizary, was booked to Sweden, at the nod of Mr. L. H. Wiedenbgelin, at 88 gs.

Lord of the Harem (65 gs.) goes very cheap to Mr. Woodward, and Royal Arch (40 gs.) to Mr. F. Munn, of Worcester; British Hope made 50 gs., just one guinea less than Mr. Savidge gave for him at Lady Pigot's sale in September; and Lord Sudely got the two months' Barrister, by Royal Arch, at 81 gs.

Forty out of the 121 (of which 46 were roans, 43 reds and white or "a little white," 26 reds, and 7 whites) were under a year old, and 12 were calved within the year. Six of the cows and heifers were served by Lord of the Harem, 11 by Thorndale's Grand Duke, and the rest by Royal Counsellor, British Hope, Royal Arch 2nd, Chief Judge, and Chief Justice. The summary of the prices is as follows:

	£	s.
87 cows and heifers at £44 12s.....	3,835	13
35 bulls at £38 16s. 5d.	1,358	14

121 £5,194 7

This gives a very satisfactory average (when we remember that no less than 132 shorthorns had been sold within the previous week) of £42 18s. 6d. Adding in the £7,219 14s. from the sheep sale of the last month, the total sum realized by shorthorns and Cotswolds was £12,414 1s. So much for using really pure blood!

The sales of the other farming stock, &c., finished on Saturday; and this week Mr. Savidge moves to the Old Lodge, which has been rebuilt, and will content himself for a time with the steam plough, which was left him by his old master as a tribute to his talented and faithful service during nearly fifteen years.

THE NEW POACHING ACT.

As might have been expected, the Poacher-police Act, over the carrying of which the country gentlemen cheered so lustily, is already bringing its friends to grief. They have made but a weapon to scourge themselves with; they have raised a Mephistophiles that jeers and ridicules his patron, defies and defeats him at every turn. After no little vexation of spirit, and at no small cost in the luxury of law, a Bench of Norfolk Magistrates have come to learn that even a suspected poacher can claim to have justice done by him. It is seldom indeed that a decision has been so thoroughly upset, or so strong a reprimand administered, as that by the higher Court in this instance; and it may be as well, by way of a caution, to give the chief features of the story. On a November day, then, so far back as the year 1862, one Fuller, a higgler, was on his way from Croxton to Thetford; and, as it happened, his route or his calling took him near the preserves of Mr. Wyrley Birch. Somewhere in this sacred locality he was stopped on the high road by two members of the rural police, who ordered him to stand and deliver. In other words, they searched his cart, in which they found a hare, a partridge, and four rabbits; but no gun, nets, nor other means for taking game. There was not even the customary carter's dog in such suspicious company, while Fuller himself was singularly ill-qualified for business of this sort, from the fact of his having a wooden leg. However, the seizure was made, the summons was issued, and, in due course, the one-legged higgler convicted of taking and destroying game in the woods of Mr. Birch, some three miles distant from the spot where the constables

encountered him, and without one atom of evidence to show that the defendant had ever been on the lands in question. Strange as it may sound, Fuller's adviser was by no means satisfied with their worship's decision, but requested that the whole matter might be referred to the superior jurisdiction of the Queen's Bench; the ordinary way of obtaining such an opinion being by having a case stated by the magistrates themselves. The Mundford Quorum at first flatly refused to do anything of the kind, and they only proceeded to do so when more peremptorily directed by a Judge's Order. How they then got up their case we should prefer to put in the very vigorous English of the Lord Chief Justice: "The magistrates sent to the Court of Queen's Bench a case, to know whether it was necessary, in order to convict, that there should be some evidence of the defendant having been upon land for the purpose of taking game, a point which they had already decided in the negative three or four times. What Mr. Walpole asked them to grant was a case to know whether or not there was sufficient evidence to convict." And, again, as to the alleged incorrect statement of the case, Mr. Keane said the direction of the Act of Parliament was not to set out the evidence, but to state the facts. The Lord Chief Justice: "But is it possible to say that they are fairly and impartially set out?" Mr. Keane asked whether they would not have been bound to set out that which would have been a most serious thing to put before any tribunal, viz., his previous conviction? The Lord Chief Justice: "I say the magistrates greatly misconceived their duty in law in taking into account, in re-

ference to the man's guilt or innocence, anything but the transaction upon which they were adjudicating, and especially a previous conviction. I cannot conceive a more woful misconception of their duty. It is not the law of England that a man should be tried by anything else than the evidence having reference to the particular transaction." Mr. Keane apprehended that it ought to have been taken into account. The Lord Chief Justice: "It ought not. I most unhesitatingly say that. Who ever heard of such a proceeding? That is the system which I know is in existence in foreign countries, but I trust it will never be introduced into our courts. We allow a man's good character to tell in his favour, but we never allow a bad character to be brought up against him. I cannot conceive a more woful mistake." Such dicta as these cannot be too keenly remembered by our county magistrates, especially in any charge against a man previously convicted or suspected of poaching. However, taking the case as they had it before them, the Court of Queen's Bench decided that they could not say there was no evidence at all upon which the magistrates could proceed, and the conviction was thereupon confirmed; although the Chief Justice then said, "If they meant to ask whether they ought to have convicted, he had no hesitation in saying that the evidence was much too slight." The very Justices would appear to have subsequently had some doubts in their own minds upon the matter, for they twice had Fuller before them ere they proceeded to put their original sentence into execution—a penalty of five pounds with costs, or two months' imprisonment. The man was unable to pay the money, and was accordingly committed to Swaffham gaol on the 30th of September, 1863. Whereupon an action was laid, charging the Rev. Augustus Sutton, the Hon. F. Baring, and the Rev. J. A. Parke, with having maliciously and without reasonable evidence convicted the plaintiff, Philip Fuller, of having unlawfully obtained game from the lands of Wyrley Birch, Esq.; that they afterwards took sundry oppressive proceedings against him, and also wrongfully assaulted and imprisoned him."

It appears that one of these gentlemen, Mr. Baring, in ordering the sentence to be carried out, was unfortunately not content with saying so much, but must needs give the reasons for himself and his reverend coadjutors taking the tardy step they did. He referred to Fuller having been "mixed up with poaching cases," and so forth; and thus out of his mouth worked his own confusion. In a very able and impartial summing-up the Lord Chief Justice said: "Every man who administered the law of this country

was bound to administer it according to the principle which obtained by our law, and which was most sacred, and he trusted he should never live to see it altered. It was a sacred principle that they should not allow a case to be influenced by a prisoner's antecedents. If the magistrates, knowing the man to be a poacher, strained the law, with a view to punish him—if they went against their honest convictions of what was the value of the evidence which was put before them, that in point of law would be malice; but if they honestly believed that the plaintiff had been upon land in search of game, they were not responsible." And a special jury, with such a direction to guide them, found that the law had been strained, that in point of law there was malice, and that they gave a verdict for the plaintiff Fuller, with forty shillings damages. His Lordship of course certified for costs, and gave Mr. Keane, for the defendant, leave to move the Court above on the points reserved, although one would think the defendants must have had nearly enough of it by this time, so signally beaten as they hitherto have been on every point they have tried.

A few more decisions like these—a few more "cases" wherein the facts are perverted, such as Fuller never having been seen off the road, nor his cart seen empty, "although the case unfortunately stated the contrary"—a little more interference from the local police, with some such Justices' justice to back them, and we shall have the country insisting on the general establishment of a system of stipendiary magistracy. It will be noticed that two of the defendants in this matter are Reverends, while there is a growing feeling against putting clergymen on the Commission of the Peace, that will be by no means abated by the result of the late trial at Norwich. As to the New Poaching Act, so thoroughly unconstitutional as it is in its action, and so vague as it is in its construction, we cannot but think that it is calculated to do a deal more harm in the long run to the country gentlemen who attempt to enforce it than to any one else. They have all the worse of the one-legged biggler of Thetford, although everybody in any way concerned is sure to suffer from game, and it is sad to see that Mrs. Bye, the shepherd's wife, who sold the rabbits to Fuller, is under "notice to quit" their cottage at Croxton. What curses to the country these vermin must be, when they bring ruin to the farmers, reprimands to parsons, and handcuffs to bigglers—when they turn poor women out of their homes, men out of their work, and poison all the kindly feeling of the neighbourhood, as much as they do the land they infest!

THE FARMERS' CLUB.

THE NEW ASSESSMENT ACT.

The monthly discussion meeting took place on Monday evening, April 4, at the Temporary Club Rooms, Robert-street, Adelphi; Mr. T. Congreve in the Chair. The subject appointed for consideration was, "The New Assessment Act," the introducer being Mr. J. Dumbrell, of Ditchling, Hurespierpoint.

Mr. DUMBRELL said; Sir, in looking at the list of subjects chosen by the committee of the Farmers' Club for discussion this year, it is remarkable that four out of the six should be of a political rather than of a practical character, and shows that there is a disposition on the part of this Club to assume to itself the office of public censor upon all and any legislative enactments that may from time to time be brought

forward, and which may affect the agricultural interest. There never was a greater necessity for this supervision than the present moment. We hear very flattering accounts from all quarters of the growing intelligence, the superior social standing, the improved capacity of the tenant-farmer of the present day, compared with his ancestors; and yet the tendency of legislation the last few Sessions of Parliament has been to take the administration of the funds of the local taxes out of the hands of the tenant-farmer who is the main contributor towards them, and to place a far larger share of the power of distributing those taxes in the hands of the magistrates of this country. And however much we may respect them as a class—and they are undoubtedly entitled to our respect—still, when

we see that gradually one institution after another is being taken out of the hands of those who appear to have the best right to their management, it is time that some protest should be made. Look, for instance, at that largely increasing burden the County Rate, in which the tenant-farmer has no voice at all. Look, again, at the New Highway Act, where at any time the ex-officio members of the highway board may assemble in such numbers as to swamp the votes of the elected members, and we may also say the paying members. And, gentlemen, in the Act which is the subject for our discussion this evening, there appears to be a strong element of this undue influence. It is not necessary to detain you by going into the minute details of this Act, which are doubtless well known to most of you; suffice it to say, that, as the union charges in the administration of the poor law from a variety of causes have considerably increased, it was found to be necessary that the assessments of properties, not only as regarded individuals in parishes, but also as regarded parishes in unions, and even as regarded unions in counties, should be equalised, and it was for this purpose that the New Assessment Act was passed. For many years past, and probably ever since the Parochial Assessment Act came into operation, much difference of opinion and great discrepancy of practice have prevailed as to the mode of arriving at a proper valuation of rateable hereditaments. The words of the Parochial Assessment Act 6 & 7 Wm. IV., Cap., 96, S. 1, enacts that rates were to be made "upon an estimate of the net annual value of the several hereditaments rated thereunto, that is to say, of the *rent* at which the same might reasonably be expected to let from year to year," &c. These words have given rise to endless controversy, and to a vast number of legal decisions. In spite, however, of all the experience gained, and all the legal lore accumulated upon the subject, differences of opinion and anomalies in principle have continued to spring up, and parishes and ratepayers have submitted to assessments rather in the spirit of compromise, and for the sake of peace and quietness (and that often after much expensive litigation), than from any real satisfaction with results obtained or intelligent appreciation of the principles acted upon. Now, it is obvious that to get rid of the prevailing anomalies, the appointment of some officer or tribunal exercising the functions of an *official valuer* was needed; and although the main object of the recent act was to give the means of a fair adjustment of taxation for county and union purposes between parish and parish, another important object was to get rid of the existing difficulties of ascertaining rateable value by *appointing official valuers*; not, indeed, the expensive highly paid gentlemen exercising that profession, but a cheap, because unpaid body, who should really exert their united judgment to value the properties subject to assessment, and who were not intended blindly to follow rigid and narrow rules to absurd consequences. If we can imagine a body of professional valuers constantly sitting to settle the fair and just value of rateable properties, irrespective of such actual rentals as are not unfrequently created by the greed of landlords, the folly of tenants, or the vagaries of both, we should have just such an assessment committee as it seems the Legislature intended to establish by the act of 1862, only less costly, because not composed of professional and highly paid men. The Act gives them every possible assistance; for by the 18th section it enables them to call for and obtain the production of all sorts of documents and records relating to rates, taxes, and valuations—not indeed

that they may become fetters to their common sense, but simply as aids to their judgment. It is to the consideration of the best means for carrying out the spirit of the Act that I would direct your attention, for we must admit that the objects desired are fair and reasonable. The first great point to be considered is, How shall the value of a property be estimated? There are three modes of doing this—either by taking actual rent as the guide, or property tax returns, or by taking comparative value. The Act says the value shall be determined at the rent a property may "*reasonably* be expected to let for from year to year;" not the *actual* rent from year to year. Actual rent is, of course, in many cases—in fact in a majority of cases—a very fair guide of annual value; but there will be exceptional cases. For instance, where land is let below its value, and it frequently does happen that a large district, it may be a whole parish, belonging to a large proprietor, is by no means fairly represented in the union assessment by taking its actual rent as a criterion. Again, another instance: From accidental causes properties may be hired at a rent above their actual value. A tenant for accommodation or fancy may be willing to pay *more* than the legitimate rent: is it just that because a man pays too much rent that he should also be saddled with too much taxes? It may be argued a property is worth what it will fetch in the market. Granted; but where is the farm, however dearly rented, that would not command a higher rent if brought into the market to-morrow? The occupier of too highly rented land naturally inquires, when he finds his assessment above that of his neighbours, why land of equal value, and similar situation to his own, should not be placed on equal terms as regards assessment for taxation? To assess land, therefore, at actual rent, there are these difficulties—you ease the burden of taxation from the shoulder of him who is already lightly taxed; you add an additional weight to him who is already over-weighted, and you run the risk of bringing all properties in a parish up to a high standard. The next mode of arriving at an estimate of actual value is by taking property tax as the guide. The great difficulty here applies, not so much to occupiers, as to owners occupying their own properties. In the case of mere occupation, property tax and rent should be represented by the same figures. Now we all know (and it is a singular fact) that although in this country we are perfectly used to the visit of the tax collector, yet every man does endeavour to evade taxation as much as possible; and although occasional notices in the *Times* do announce that A. B. has sent the half of a £5 note to the Chancellor of the Exchequer on account of unpaid income tax, it may be taken as a rule that no owner of property, being occupier, makes his return under Schedule B too favourably to the revenue; and I appeal to all members of assessment committees if their experience does not lead them to the conclusion that cases of properties held by owners are inadequately represented in the union assessments by property tax returns. Besides all which, it is a well-known fact that the returns to the property tax are made very loosely or inaccurately, and in many cases, whether purposely or carelessly, no returns are made to the assessor at all, and that officer makes his own guess at the value; and many persons are exempt from income tax, in which case neither they nor the revenue officers care anything about a correct assessment. In my own and two neighbouring parishes, out of 290 assessments, there are 96, or nearly one-third, which make no return. Another argument against taking actual rent or property tax return—

rather, another argument against the mode of working the Act, if these criteria are taken—is that there can be no need for the cumbersome machinery of parochial committees to make out valuation lists, or assessment committees to sit in judgment upon them, because any overseer or ordinary clerk could compare the whole of the lists with property-tax returns, and there would be an end of the matter. Of course, it is a much easier plan to adopt some simple rule which shall do for all cases than to judge every case on its own merits; and if assessment committees can find such a rule, and can avoid the exercise of independent judgment, they will be saved from much thinking, and escape a vast amount of trouble; but then they, in fact, abdicate their functions, and leave the Quarter Sessions to do their work for them. If the above views are sound, it follows that assessment committees should boldly and really value the properties to be assessed, exercising a conscientious judgment to the best of their ability. By so doing, they would, no doubt, carry out the spirit of the Act, and become efficient and valuable tribunals; but if they do otherwise, and tie themselves down by rules to adopt as infallible criteria of value either actual rentals, property tax assessments, or other standards, which always ought to be right, but which are often very wrong, they will, of course, reproduce all the old evils, and instead of litigation being diminished it will be greatly increased. We now come to the third proposed mode, viz., of taking comparative value of property—in other words, of revaluing the whole of the parishes in a union. This is to do no more or less than what has been done before; with this difference, that, as before, the only object in view was to obtain equality of rating between individuals in a parish, equality among parishes is now also indispensable. It is not to be supposed that even this plan could give entire satisfaction; but if the whole of a union was valued at one time and on one basis, the probability is that a more uniform system of rating would be arrived at. One other objection to this plan is on the score of expense, but this would be a secondary consideration if the object desired were gained. I have now endeavoured, as briefly as I can, to point out the three plans by which the object of the Act may be attained, and a uniformity of rating established. Our next question is the mode of appeal in cases where dissatisfaction has been given. As you all know, the first appeal is the assessment committee; but experience leads me to the belief that an appellant seldom finds redress there, and as a last resort he is driven to appeal to Quarter Sessions. And who are the judges? The very men who are probably chairmen of most of the assessment committees in the county, and who, in spite of all the evidence that may be brought before them, adhere strictly to the principles they have laid down to their respective boards of guardians or assessment committees, and this is one of the most unjust parts of this Act. We all know that in some boards of guardians the weight of *ex officio* influence is very heavy, and the views of these guns of large calibre in a great measure guide the opinions of less independent members; and yet, as I said before, a court composed of these very *ex officio* members of boards of guardians is the last appeal for a dissatisfied ratepayer. Now that we are on the subject of appeals, you will perhaps allow me to illustrate my case by relating the history of my experience in my own parish, which will perhaps exemplify more clearly the working of this Act than any theoretical opinion may do. In the first place, when the new valuation lists were required, a committee of the parish officers was formed, assisted by some of

the principal ratepayers of the parish, and much time and midnight oil was expended in forming to the best of our judgment a fair valuation of the parish, by placing every property as nearly as possible at its legitimate value. This valuation list was returned from the assessment committee as unsatisfactory, being too low. As we did not feel justified in making any alterations, the assessment committee made them for us—that is to say, they altered every property in the parish to the figures of schedule A, and, in its amended state, was returned to us as finally settled. With this we were immensely dissatisfied, and for this reason—under the old Assessment Act, our own and several neighbouring parishes were valued by the same professional valuer, and, at the same time, a guarantee that they at any rate were valued on the same basis; and yet, upon the return of the valuation lists from the assessment committee, it was found that while we were raised 30 per cent. above our old valuation, our two immediate neighbours were raised only 10 and 12 per cent. respectively. This state of things of course provoked enquiry, and it was found that there were gross inaccuracies in the valuation lists, from following implicitly schedule A. An appeal was then attempted to the assessment committee by the overseers of our parish, but they were refused a hearing, on the ground that the committee had no power to hear the collective complaint of any parish through the overseers, but that any complaint must be made by the individuals whose property was supposed to be unfairly assessed. I may observe, in passing, that I doubt very much the accuracy of this judgment. But to proceed: as our last resource, we appealed to Quarter Sessions, and to support our case, we employed two professional valuers, men perfectly independent and of high standing in the county. In our own parish we submitted 33 cases to their notice, 28 of which they found to be seriously over-assessed, that is, to an extent reaching 30, 40, 50, and even 68 per cent.; these 28 properties were placed on the valuation list at £600, whereas our valuers estimated them at £415, or at £184 less than the assessment committee figures, or at a reduction of 30 per cent. on the average. A very remarkable instance of the injustice of taking property tax as a guide occurred in this parish. A small property of 20 acres of wretchedly poor land was returned, under schedule A, at £31 10s., or 35s. an acre, without house or buildings; while the farm immediately adjoining, divided only by a hedge, and, in fact, originally part of the same property, is let for 10s. an acre, is so returned in schedule A, and re-produced in the assessment committee's figures. Our valuers put the 20 acres, of which I speak, at 10s. per acre, thus verifying the actual rent paid by the adjoining property. I could multiply such cases as these; but to proceed. In the first parish against which we appealed, as being too low, our valuers found that in seven properties of 859 acres, out of a total acreage of 1,137 (more than two-thirds), the increase was £161—£647 against £486, or an increase of 33½ per cent. In the second parish the valuers went over six properties of 1,618 acres out of a total acreage of 2,090, and their figures stood £1,231, against £1,008, an increase of £223, or 22 per cent.; the total grievance therefore amounted to £568. The guardians of the union defended the case. They employed no valuers. We were both, of course, represented by counsel, and, after a long trial of eight hours, finishing at midnight, the decision was remarkable. In our own parish no alteration whatever was made. In one parish only one alteration—the case of an owner and occupier—an advance from £140 to £185, and in the other

parish five occupations were raised from £425 to £539; and one, where the owner was occupier, from £30 to £10. The costs were ordered to be paid by the union. The most unsatisfactory part of this decision is this—that the magistrates, although disallowing the fact of property tax and actual rent being taken for an absolute rule, have laid down no other principle for the future guidance of assessment committees, unless this—that it is quite competent to raise assessments, but quite out of the question to lower them. The most melancholy part of this history remains to be told; the costs of this appeal amounted to no less a sum than upwards of £250, and it must be borne in mind that the appellants, only, employed valuers; the respondents merely called their clerk to show the principle which had guided them. It appears, then, that an appeal to Quarter Sessions is practically denied to those who may dissent from the decision of the assessment committees. I venture to think that this case proves the justness of my premises, viz., that no absolute rule based on actual rent or property tax return can possibly be laid down, in estimating the value of property for the purpose of assessment; and where such rule has been adopted, much injustice must necessarily follow, and the object of the act be altogether defeated. I should weary the meeting by going into other cases of appeal which have come under my notice, and where the decisions have been utterly devoid of any recognisable principles, and appear really to be merely hap-hazard or arbitrary opinions. In conclusion I would observe, that whilst the ends sought by this new Assessment Act are perfectly fair, the means to attain them are as yet very indistinctly understood; and, if care be not taken, far from giving satisfaction by the equalisation of assessments, this act will be a fire-brand thrown amongst parishes and ratepayers, leading to no end of ill-feeling and litigation.

Mr. HENRY CHEFFINS (Easton Lodge, Dunmow) said the remarks of Mr. Dumbrell were so complete and unexceptionable, that they had really left but little for anyone else to say. He might, however, observe that he had had some experience with regard to appeals, or rather objections to assessments—for in his part of the country appeals were scarcely allowed—and had had occasion to make very strong objections to the manner in which assessments were carried out in many parishes in his own immediate neighbourhood, where the system adopted was certainly not in accordance with the principle advocated by Mr. Dumbrell. The Assessment Committee had there taken it upon themselves to set up one general rule—a sort of Procrustean bed; that is to say, for good land and bad land alike, for land worth 50s. an acre, and land worth only 10s., they had deducted 2s. per acre in order to arrive at the rateable value. If he knew anything about the matter, that was a most unbusiness-like mode of proceeding. The principles which were carried out were, in fact, so different in different unions, that there was no general system in the country at all. Some two years ago he went before the magistrates of his county, when they were making a new assessment of the county rate, and he found that the object aimed at was simply to arrive at the gross sum which should be paid by each parish instead of partly carrying out the principle which Mr. Dumbrell had suggested, that of taking the property tax as the rule, and partly taking the aggregate sum which each parish should pay and leaving it to the parish to divide the amount among the ratepayers. This last was the mode of proceeding which would give the greatest satisfaction in the county.

The Rev. E. SMYTHIES (Hatherton, Loughborough) said, having been chairman of the assessment committee of his parish, he naturally felt considerable interest in the working of the new act; and he thought that every gentleman in that room, or in the country, who had occupied that position, must concur in Mr. Dumbrell's remarks as to the utter inadequacy of the appeal, whether to the Board of Guardians or the Court of Quarter Sessions, provided for by the Act. When he first read the Act, it appeared to him to have been drawn with great fairness. The object of it was manifestly to place the valuations in the hands of those who were best able to answer the question: "What would such and such a property be likely to let at? what is its fair rateable value from year to year?" The responsibility was placed so entirely with the parochial authorities, that it seemed a fair presumption that they would arrive at the best result that their judgment enabled them to do. Well, he had no doubt that in many parishes the object aimed at by the Act was carried out, and that the parochial authorities with whom it rested to carry it out fairly had acted conscientiously. He must, however, speak on that occasion of facts within his own knowledge. When the valuation was made in his own parish and in some adjoining parishes—he would call them parishes A, B, and C, for the purposes of illustration—the average valuation in parish A was 45s. per acre, in parish B 43s., and in parish C 35s. The parish which was represented by the letter A, and which was in fact his own parish, was extremely dissatisfied with that result, and deputed him to bring the matter before the Court of Appeal provided by the Act, so far as it might be thought wise to proceed in the matter. He did so. He stated on behalf of those with whom he acted that they did not at all desire a departure from the decision which had been arrived at, with regard to the value of their own parish, but that they felt perfectly sure that parishes B and C ought to be put at a much higher average rate. The ground of that opinion was, he said, that within the last thirty-five or at most forty years, nearly every acre of land in parish B had been sold by auction, and that during the same period a very large proportion of parish A had also been sold by auction, and that in the former case the land always sold for £30 or £35 per acre more than in the latter; while in parish C, where the rating was 35s. as against 45s., had had also been extensively sold within the same period, never realising less, and in many cases realising much more, than the land sold in parish A. While, therefore, they did not wish to have the valuation of their own parish lowered, they thought that the two other parishes ought to be raised so as to pay a fair proportion. He (the Rev. Mr. Smythies) had no desire to cast any aspersions on assessment committees, but he thought that an error in judgment had been committed by Parliament with regard to appeals. What did they find when they went before the Board of Guardians? The chairman of the board in his own district, for example, was a most estimable man, but the most estimable men were liable to a bias of judgment, especially where their own pockets were concerned (Hear, hear.) As a considerable owner of property in parish C, the chairman was, of course, quite convinced that 35s. was a proper valuation. Moreover, it often happened in other cases that the chairman's tenants were sitting with him on the assessment committee, and they knew that to offer an opinion to the contrary might be very disagreeable and perhaps personally offensive, and it was scarcely in human nature for persons so situated to say or

do what would be likely to give offence. The assessment committee of the guardians, in answer to every appeal, said the assessment was in accordance with schedule A." He and his friends replied, "We have nothing to do with schedule A. We could give many reasons why the valuation under that is defective. The Act provides for a fair, original, and independent valuation of each parish, without any reference to the income-tax returns, or any returns whatever; and according to that valuation the assessment ought to be put down." Still the Board shrugged their shoulders, and they said, "These valuations have been very carefully gone through, and we think it is but fair to assume that income-tax returns, which have been established for some years, are correct." The objectors rejoined: "There is no better test of value than sales by public auction, especially when they are spread over a large number of years, and facts amply bear out our argument that the two other parishes ought to be rated higher than ours." However, the result was, as in the case referred to by Mr. Dumbrell, that they got no redress whatever. It appeared to him, then, that the Act had entirely failed to provide an adequate appeal against the decisions of those who were locally and personally interested in the questions brought before them (Hear, hear); and until there is some central authority like the Poor Law Board or the Tithe Commissioners to be appealed to—some authority which was likely to be impartial and independent, and which would be responsible to the Government and to Parliament, the object of the Act would never be properly carried out.

Mr. OWEN WALLIS (Overstone Grange, Northampton) said there was one point, forming a very important feature of the Act, which was not touched upon by Mr. Dumbrell. He alluded to the very great inequalities in the deductions made in different unions and different counties from the gross estimated value, in order to arrive at the rateable value. They must all know that unions were, in many counties, mixed up with unions in adjoining counties; and, in many cases, differences like those to which he referred entirely upset uniformity in the working of the Act. A gentleman who had taken a very active part in the Peterborough Union—a member of an assessment committee—told him that that union comprised parishes in Northamptonshire, Lincolnshire, and Rutland. That before the Act came into operation, a meeting was held in each of those counties, at which resolutions were passed, settling the deductions to be made in respect of insurance, repairs, and so on, and that in each case a different standard of deductions was adopted. The parishes in each of the three counties comprising the Peterborough Union, wished to adhere to the resolutions passed in those counties, and the result was that there were three different standards of deduction in that union. Of course nothing scarcely could be worse or more confusing than that state of things. He found that the unions in the county of Northampton were connected with thirteen other unions in the surrounding counties, and hence there were great discrepancies, not only as regarded the unions in adjoining counties, but also among the unions of his own county. This was a great stumbling-block in the way of the establishment of anything like a uniform rating throughout the whole county. On the whole, the assessment committee to which he belonged had thought it best to wait to see whether the Legislature could not this year, or at an early period, correct these anomalies. They considered it, in fact, not improbable that either the Legislature or the Poor Law Board would arrive at some definite conclusions;

and that, in consequence, general instructions would be issued as to the rules by which such matters should be determined. They had found that, by dealing with the matter themselves, they were wasting time. They could not give satisfaction to themselves, and therefore were not likely to give satisfaction to those for whom they were acting. They had gone through the lists, but were not very well satisfied with the result. They commenced by taking the property tax, not as a rule, but as a guide (Hear, hear). The first returns sent to them were in many cases simply copies of the old rate, and were anything but correct with regard to the property either in their own parishes or in other parishes of the Union. Instructions were then given to the overseers that where the property tax, in their estimation fairly represented the rateable value, that should be taken as the standard; and that in exceptional cases, where the return was too high or too low, the property should be dealt with on its own merits. Accordingly, new lists were sent in; but they found some great discrepancies, and on that ground they thought it best, as he had said before, to wait and see whether the Act would be amended. Unfortunately, that had not yet been done. Whether or not it would, he was, of course, not prepared to say. It was, however, impossible at present for anything like a uniform rateable value to be placed upon property; and the great thing to be desired was that some definite rule should be laid down for the guidance in that respect of overseers and assessment committees. They had come to a series of resolutions, in which they declared that they declined to take further steps in the matter. These resolutions had been sent to the Poor Law Board; and they were now waiting to see whether anything would be done. If nothing were done, he supposed they must resume their labours, and do the best they could; but they were certainly placed, at present, in a most unsatisfactory position. They went into an inquiry with every desire to do justice to all parties; but as they could not please themselves, it was not very likely that they would be able to please others.

Mr. J. WOOD (Ockley, Hurstpierpoint, Sussex) quite agreed with Mr. Wallis that, unless they obtained some rules for their guidance, they would be quite as much at sea with respect to valuations as they had been heretofore. In his own parish the plan adopted was to take down the whole of the properties as they were assessed to the property tax, and then to select from the number a certain standard. They went as nearly as they could to the actual rent, which was generally obtained from Schedule A of the property tax. They could not make a calculation of the value of farms to let at the present time, in a wheat county, with the present price of wheat, or the rents would be nil. Their plan was, not having, as Mr. Wallis said, any definite rule for their guidance, to meet the case by compromise; they determined to raise the valuations, attaching a little more rating proportionately to properties which were returned high for the property-tax, thinking that as those who made the returns partly brought the difficulty upon them, it was but fair to make them pay something more on that account (laughter.) That was the only course they could pursue in order to save the expense of a new valuation. He (Mr. Wood) would not object to the expense of employing valuers if he thought they would arrive at a satisfactory result; but he had doubts on that point, and therefore he thought it best to adopt the expedient of a compromise, and then wait to see whether any steps would be

taken to amend the Act or to institute some new board, which would give the overseers rules for their guidance. He did not indeed himself see what could be done in that respect. He had hoped that some suggestions with reference to that object would be made that evening; but so far as he could judge, the meeting would pass away without their having heard any observations of what course should be pursued by the Legislature or the Assessment Committees generally. He thought they could not come nearer to the value of the land than they did by taking certain properties as a criterion of value. He was not sure that they had yet arrived at a juster valuation than existed before the Act was passed (Hear, hear); but the Act must have had the effect of raising assessments very considerably, and must have materially assisted the Government in raising the produce of the income-tax (laughter.) He did not, however, see how under the circumstances that was to be avoided.

Mr. W. H. BURKH ROSEY (Tanfield Court, Temple) said the objections which they had heard that evening appeared to him to apply not so much to the Act itself as to the difficulty of carrying it out. Many of the gentlemen around him were probably members of assessment committees, and if they would but take the Act in a strict sense, according to the different sections, they would thus avoid, he believed, a great deal of the difficulty which existed. Within three months after the Act became law, it was incumbent on the overseers of the different parishes and unions to make out a list of the rateable hereditaments. He would assume that that had in all cases been done. That list was then subject to revision. In the event of its being supposed by any person concerned, or by the overseers of the parish, that the valuation of the rateable hereditaments was not a fair one, they might, if they chose, appoint some person or persons to make a fresh survey of the parish. Now, had that been done? Before they found fault they ought to enquire whether the machinery provided for carrying out the Act has been really put in operation (Hear, hear). It appeared to him that wherever it might be necessary a fresh survey of the parish should be made; and the expense of making it in the first instance would perhaps be much less than the cost of £250 for an appeal like that mentioned by Mr. Dumbrell, without any practical result. When a survey had been made in a proper manner, all parties probably would be satisfied. He did not understand from Mr. Dumbrell that the power of ordering a survey in the various parishes had, so far as he was acquainted with them, been actually exercised. Some years ago he (Mr. Rosher) was a parish officer—he was not so now, not living in the country—and he must say it appeared to him that the only fair way of testing the Act was to try and carry out as far as possible the machinery which it provided. Our objection of Mr. Dumbrell was that the disposition of the funds was taken from the tenant farmers. That must, he thought, be a mistake. As he understood the matter, the members of the assessment committees were chosen from among the guardians, and the guardians were usually chosen from among the tenant farmers. Hence, the tenant farmers had the control of the funds in their own hands, and if because the chairman happened to be a gentleman of high position, as regarded property and station, they chose to knock under to him instead of asserting their independences and using their judgment as Englishmen, that was their own fault (Hear, hear). Every gentleman who sat at the board, whether he was a landed proprietor or a tenant farmer, sat

there on the same footing. The tenant farmer had there, as much a right to assert his opinion, and to advocate what he believed to be right and proper being done, as the man of large landed property. The members were all chosen by an elective body in the first instance, viz., the Pariah Vestry, and they were bound, not merely for their own sakes, but for the sake of the interests which they represented, to act on their own opinions, and they ought not to blame the Act for evils which it was in their own power to remedy. As regarded the question of appeal, he agreed with Mr. Smythies that it seemed an anomaly to appeal to the Court of Quarter Sessions, which was composed almost entirely of persons who were interested in this matter, and that it was very desirable that there should be some central body, which would be a court of appeal on all questions of that kind. The sections of the Act should, however, in his opinion, first be carried out, regardless of expense and trouble; for he believed that in such cases trouble as well as expense was a powerful motive. Let this be done, and he believed the result would be, in most parishes, a fair equitable valuation which would last for twenty or five-and-twenty years. Of course there would still be disputes; and to meet such cases, there should be a court of appeal, like the Poor Law Board. As to the Act, having read it carefully, he must say it appeared to him good in itself, as well as founded on good intentions.

Mr. FISHER HOBBS said he had not intended to make any remarks (although the subject was certainly an important one, in connection with the cultivation of the soil), because it had been brought forward in so able a manner by Mr. Dumbrell that he did not think anything which he could add would be of any advantage; but he rose to correct an error which the last speaker committed on a main point, when he said, in effect, that the tenant-farmer might have justice done to him in the assessment committee. Now the speaker overlooked the important fact that one-third of the members of the assessment committee were *ex-officio* guardians, and probably landed proprietors. There were also a number of clergymen in the present day who were anxious to represent their parishes. In the case of his own union, the four *ex-officio* guardians took special care to select two clergymen on the assessment committee. Before any meeting was held, one of these gentlemen came to him, and said: "Don't you think the land in this neighbourhood is let at a very low rate, and that it ought generally to be put at a higher value?" and an *ex-officio* chairman of the committee actually invited a person who was living near the seaside—a cordwainer or ropemaker, or something of that kind—to come into parishes in the interior of the union to give an opinion of the value. He (Mr. Fisher Hobbs) mentioned the subject to one or two of the guardians of the district. He said to them: "You are beaten before you commence. The object aimed at is to put up every piece of land as high as possible." Every clergyman who was a tithe-owner naturally looked closely after his own interest. He appealed to Mr. Smythies whether that was not the case (laughter).

The Rev. Mr. SMYTHIES: I am happy to say I am not a tithe-owner.

Mr. FISHER HOBBS continued: In the county of Leicester the clergy were fortunately situated, for instead of taking their income in tithe, as was generally the case, they had it in the shape of land; but the clergy generally throughout the country were interested in the raising of the rentals of land. In his own union there were six persons who were deter-

mined to put up the valuations. Half the committee, four *ex-officio* guardians, and two clergymen were interested in putting up the value of land, and the chairman having the casting vote, the tenant farmers had but little chance. The consequence was that most egregious errors had been committed. Persons had been sent through a parish to value, who did not know the boundaries; and while land which was no better than heath-land had been valued at 10s. per acre above its value, land which was worth 5s. an acre more than any other in the district was assessed at about the lowest rate that was to be found in a union of twenty-eight parishes. He believed that unless some alteration in the law took place—unless a court of appeal were provided, this question of value would be a matter of controversy for some years (Hear, hear). He felt very much indebted to Mr. Dumbrell for the way in which he had brought forward the subject. It was, in his opinion, a legitimate one for the Club to deal with, and he hoped they would aid any member of the Legislature who might think proper to bring it before the House of Commons (Hear, hear).

Mr. E. K. FISHER (Market-Harborough) said that the subject was interesting to him as belonging to a class which had not been particularly commended in that discussion, he meant the land-agents. He was resident in Leicestershire, on the borders of Northamptonshire, and had had something to do with the making of the assessments in both those counties; and although great ability was shown by the gentleman who opened the discussion, he must say that he left untouched some details of the question which would have assisted them in judging of the motives with which the Assessment Act was passed. The first point connected with that act was, of course, the standard of value; and he did not think the Legislature could have adopted any clearer mode of defining it than that of ascertaining what the property was fairly worth to rent. He did not consider the rent paid at all a fair criterion, nor did he think the property-tax assessment a fair one. The standard which had been adopted would, if it could be arrived at, be perfectly fair. The old standard of value was, in fact, none at all. The only object of farmers in the old valuations was to keep lower than their neighbours, or to keep the land of one parish as low as possible in relation to others. The object of the Act in that respect was the adoption of a fair standard as between all parties concerned. The difficulty lay in carrying it out. An assessment committee ought not to constitute itself exactly a board of valuers, for in that case it was impossible they could arrive at more than a guess of value. Even men whose lives had been spent in making valuations were often wrong, and no assessment committee could, without assistance, make a proper valuation. He thought the committee could not do better than start with the property-tax assessment, and let that be amended upon the evidence which might be brought before them. They were only judges of evidence; and it was for those who were interested to bring forward their facts. Supposing the result should not be satisfactory, the committee might then appoint valuers. Being a valuer himself, he thought that would be the best course (laughter.) Seriously speaking, he thought valuers were much fairer judges with regard to parishes with which they had nothing to do personally than persons who lived in them. It was true that those who lived in a parish might know every acre of land in it; but then there were little feelings of self and of jealousy, which could not be done away with in such cases, and on that account it seemed to him best that valuations should be made by persons who lived outside the parish. To this he would

add that assessment committees, instead of going the cheapest way to work, advertising for valuers who would do the work for the least money, should take care to appoint competent valuers. It would, he believed, be best to appoint two valuers, as two generally performed the duty more satisfactorily to those interested than one; and after such a valuation as he suggested there would be no difficulty, and probably no necessity for appeal. In a union with which he had been connected—it was in Northamptonshire—he had had, with another person, to value some ten or a dozen parishes. The assessment committee called them before them to give them instructions. There had been a meeting of Chairmen of the Boards of Guardians, in order to arrive at some definite deductions from the gross rateable value—one of the worst things that had ever been done; for gentlemen who had not previously discussed or considered the matter could not possibly arrive, in such a meeting, at a system of deductions which could be fairly worked out. When he and his friend went before the Assessment Committee, they said to the Committee, "Do you wish to dictate to us? Do you wish, for example, to lay down any rule with regard to deductions, or for the valuation of woods? If you do, we cannot substantiate our valuations on appeal." The Committee, after considering the matter, said, "No: we will leave you to do as you think best." Accordingly, they proceeded to do what they considered right, first of all arriving at what they considered the fair value of the land to rent, and then adopting what they conceived to be a fair principle of deductions. He (Mr. Fisher) was in a business in which his father was engaged before him; and he knew something, therefore, about the old-established system, which ought not always to be ignored, as was too apt to be the case in the present day. At the meeting in Northamptonshire the system of deductions adopted was, an allowance of five per cent. upon land without premises, and fifteen per cent. upon land with premises. Now they (the valuers) did not approve of that mixing up of land and premises together: they thought that the plan thus adopted offered a premium for the building of a sort of hovel upon land, and would create great confusion as between two farms differently situated in that respect. There was, too, this difference about that per-centage arrangement—that the deductions on land worth £2 per acre would be twice as great as those on land worth £1; whereas it would cost quite as much to keep poor land in a state to pay such rent as it would do to keep good land in that state, and perhaps rather more. Thinking, then, that the per-centage system would not do, they endeavoured to substitute for it something better; and the result was that they adopted a principle which coincided as nearly as possible with his experience in the management of property. They thought that 1s. 6d. an acre was a fair deduction for grass land, and 2s. 6d. an acre for ploughed land. They valued houses and premises separately; and in proportion to their condition taking into account whether they were old or new, thatched or slated, they deducted from 18½ to 25 per cent. In accordance with this plan, the Committee altered all the assessments in the parishes; and he believed there was a general impression that the work had been done in a satisfactory manner. There was another difficulty which, though slight, ought to be dealt with in case any amending act should be proposed; he alluded to the deduction of the tithe rent charge from the gross rental value. Under the present Act the tithe rent charge had to be deducted from the gross value in the case of land which was subject to tithe. Thus land which was worth 40s. an acre to rent, was, after the deduction for tithe, put at a gross value of 35s. Hence

land which was titheable had an advantage over land that was not titheable, and was returned at a gross value of 35s., while similar land, in a different position as regarded tithes, started from 40s. That could not be remedied very well without making some alteration in the Tithe Commutation Act. Perhaps the simplest and best plan would be to deduct the rates at a certain per-centage in the first instance from the Tithe, so that every tenant would pay on the full amount, including the tithe, of the value of his farm. That would make all parties equal. He and his friend who valued with him found it necessary to deal with that question in a rather complicated way. Land which was worth as much as land let at 40s. an acre, and only paid a rent of 35s., exclusive of Tithe, being worth a little more to rent, they increased the valuation a little. There was one other point on which the Act required to be amended. He thought it should always be left to practical men to decide what were the proper deductions, and that was a matter which should not be interfered with by the Government or the Legislature. Moreover, it was in his opinion quite right that in the first instance the decision should be left to the Assessment Committee, whose object was of course only to do what was right. He did not believe the *ex officio* members wished to do what was wrong any more than tenant farmers; and, so far as he could judge, they stood quite as much aloof from all influences. He would not say a word against a body of men amongst whom he lived and whom he highly respected; but he must say that he thought there was not a pin to choose between the two, both being selected from the best men in the district. When, however, an appeal was made from the decision of the Assessment Committee to the Court of Quarter Sessions, that Committee should be provided with the means, he meant the pecuniary means of defending its assessment, and the want of such means was a great defect in the present system. When appeals were made to Quarter Sessions, there was no one to represent the Assessment Committee. The cost of representation ought not to be borne by the Committee.

Mr. DUMBRELL: In our case they are borne by the union.

Mr. FISHER said that was because that union happened to be a good-natured one. There was no mode of charging the expense of appeals made to Quarter Sessions in defence of a list passed by the Committee, and that was, he repeated, a great defect in the Act.

Mr. W. BROWN (Tring) said, as a parish officer and as a surveyor, he had had some experience in relation to this subject, and could confirm the last speaker as to the assessment committees being unable to defend their own decisions upon appeal. In his parish an appeal had been recently made by the London and North Western company against a valuation made by the assessment committee, and which they thought fair and right, and it was now a serious question who was to decide the matter. In his experience he had seen the greatest mistakes made with regard to deductions. He agreed with the last speaker that it was impossible to lay down any general rule, and that individual cases must be dealt with separately. One parish in his own union was dissatisfied with what the committee had done, and appointed him to go over the parish and make an assessment, the result of which was that considerable difference was made individually, but the total came out about the same. The assessment was altered by the assessment committee in two cases only throughout the parish. What were those cases? Why in parish A there were 80 acres of land and a capital house and homestead, while the remainder of the farm was in the adjoining parish B, and without buildings. He did not proceed upon what the land in the

parish A was stated to be worth alone, but took the house separately, the homestead separately, and each field separately; the result was that he brought the valuation up (including the buildings) from about 25s. to 40s.; the committee, however, put it down again to the average of the farm. He would defy any one to come to a right conclusion in such cases without going into all the details. Then as to establishing one rule for deductions. He knew farms of 400 acres worth from 15s. to 20s. per acre; others of the same extent worth 40s. per acre, with equal buildings. Would it be right to make the same rate of per-centage on both? Hence it was necessary to make a careful valuation of the whole property. No doubt the spirit of the Assessment Act was perfectly fair, but in many places it had not been carried out fairly. This was not indeed to be wondered at, as almost every farmer had turned valuer, and yet if they questioned any two adjoining occupiers, who ought to know best about the value of a farm, they would find perhaps that they differed more than any others. As regarded the cure, he believed there could be no mode of proceeding that would satisfy every body; but the best course was to employ competent independent persons to value, and not those cheap persons, whose valuations would not be worth the paper they were written upon. As to the expense, he might give them some data. Some time ago he was appointed, together with an old member of that Club (Mr. Bennett), to value an entire union, comprising 40,000 acres of land and 8,000 houses. Mr. Bennett being struck down with paralysis, other persons were appointed, and the total cost of the work was to be £1,250. He agreed with a preceding speaker that no one person ought to be entrusted with extensive valuations.

Mr. C. H. DAVIDS (Banbury) wished to add one word to what had just been said on the question of expense. Having had a good deal of experience in respect of appeals to assessment committees, he had no hesitation in saying that the expenses of appeals far exceeded, in many cases, the cost which would have been incurred by having a valuation made by a competent person of the whole parish.

Mr. DUMBRELL then replied. He observed that, as he had expected, not one of the speakers that evening had given an unqualified approval of the New Assessment Act; while the tendency of the remarks of most of them pointed to a professional valuation of unions, instead of the matter being left in the unsatisfactory state that it is now. He agreed with Mr. Fisher that cheap valuers were not desirable; the better the standing of the valuer is, the more likely was the valuation to prove satisfactory. As regarded the appointment of a central board of appeal, suggested by Mr. Smythies, it should be recollected that, after all, any such authority must depend on professional assistance. Every one admitted that the spirit of the Act was just; it was in the working out of details that difficulties arose. It had occurred to him that it would be a very good plan for every assessment committee to have one or two professional men, who should at the outset go over all the parishes in the union. Where parishes were afterwards satisfied to leave the amount to the valuers, well and good; where the case was otherwise, let the dissentients employ professional men to meet those of the assessment committee, and let the court of appeal be the board of guardians. It struck him that that would be a great improvement on the existing state of things. As regarded a central committee of appeal, such as the Poor Law Board, he had doubts whether it would work satisfactorily. He hoped, however, that in the next session of parliament there would be some modification and improvement in the Act, by which the difficulties that had been referred to that evening would be removed.

On the motion of Mr. Skelton, seconded by Mr. Fisher Hobbs, a vote of thanks was given to Mr. Dumbrell for his introduction; and thanks having been also—on the motion of Mr. Fisher Hobbs, seconded by Mr. Dumbrell—awarded to the chairman, the proceedings terminated.

CATTLE DISEASES PREVENTION BILL.—The Special Committee have selected the following gentlemen as witnesses on the proposed operation of this measure:—John Clayden, Thomas Congreve, W. Fisher Hobbs, Robert Leeds, Owen Wallis, and Professor Simonds.

ON CLIMATE.

KINGSCOTE AGRICULTURAL ASSOCIATION.

The monthly meeting of the above Association was held at Hunter's Hall, on Tuesday, March 16th; Mr. George Robinson, of Slimbridge, in the chair. Mr. J. T. Harrison, the President of the Association, read the following paper, "On Climate." The attendance was large. Amongst those who took part in the discussion were Col. Kingscote, S. Long, G. Thomas, E. Drew, B. Drew, H. Butt, C. Ford, D. Holborow, the Hon. Secretary, &c., &c.

The subject which I have the pleasure of bringing under your notice this evening may not appear so practically useful to you as many of those we have discussed at these our quiet social meetings; it is one, however, very full of interest, will well repay study, and be surely found one of the most engaging departments of natural science.

We will first consider the sources of heat. These are, 1st, the heat of the earth; 2nd, that of the sun; I might add, chemical action in the soil.

1st. The heat of the earth. In any latitude, at a depth which is small compared to the earth's radius, the temperature is permanent throughout the year, the effects of solar radiation being confined to a superficial stratum of inconsiderable thickness. This fact has been fully established by long-continued observations in the cellars of the Observatory at Paris, and by observations in the mines of Cornwall, Scotland, and other countries.*

The temperature increases rapidly as we descend into the earth. I have myself been down one of the deepest pits in the North of England, where the thermometer stood at 90 degrees. From careful observations there is now little doubt that the interior of our earth is in a molten state, and that the solid crust encompassing it is considerably less than 100 miles in thickness. Time was, no doubt, when this internal heat played a very important part in the earth's vegetation, and it is very probable that that most extraordinary vegetation which is the shape of coal is so much conducing to our comfort this evening was stimulated in its growth by the internal heat of the earth rather than by the sun. This subject has been well argued by Dr. McCausland, in his interesting little book, "Sermons on Stones."

One peculiarity of the vegetation of the great coal formation is the entire absence of *season rings*, those marked signs of the sun's influence. In fossil trees of a later geological date, these *season rings* become marked features, evidencing the sun's pre-dominating influence. The earth, no doubt, is still gradually cooling down, and thus there is probably a constant supply of heat to the earth's surface from within it. This seems in some measure borne out by some observations made by Mr. Backhouse, at York, on the 7th of Jan., during the severe frost.—(See *Times*, January 16, Letter from Admiral Fitzroy).—Mr. B. found that a thermometer placed upon the bare ground indicated 10 degrees; whilst one seven feet distant, separated from the earth by a Russian mat and a thin board, stood at three degrees, or seven degrees lower than the naked earth.

We shall next consider the second source of heat, viz., the *radiation of the sun*. The sun is constantly sending out in every direction rays of light and heat. When we consider the effect of the few rays that fall upon our comparatively little world at the great distance it is off, how it surpasses our limited means of conception to grasp any definite idea of the intensity and immensity of the heat given off by it in all directions! These are the source of heat more directly affecting climates. Now these rays can fall *perpendicularly* only upon a limited area of the earth's surface at once. This area is daily extended into a band or girdle round the earth by means of its daily rotation on its axis, and to a still wider girdle in the course of the year, or during its revolution round the sun. This extended girdle, receiving during the year the sun's perpendicular rays, is in consequence of the axis of the

earth's rotation not being at right angles to the plane of its revolution. (Illustrated with a turnip and lamp.) This band or girdle extends for about 23½ degrees on either side of the equator. This beautiful provision is the cause of our seasons, as you are no doubt aware, spring and autumn corresponding with the period when the sun's rays strike perpendicularly on the equator, when the days and nights are equal—midsummer with us, when the rays fall perpendicularly on 23½ degrees of north latitude; midwinter when they fall on 23½ degrees of south latitude: in the southern hemisphere summer and winter being exactly reversed. Upon all the rest of the earth's surface, except this band of which I have spoken, which is the tropical region, the sun's rays must fall more or less obliquely. The more obliquely, the greater the surface over which the rays are spread, and consequently the less the warming effects produced. Thus the temperature gradually diminishes from the equator towards the poles.

There is, however, a compensating element which materially affects the result, namely, the comparative length of the day and night. All places within the tropics have nearly twelve hours of day and twelve hours of night throughout the year; but, as we recede from these tropical regions, we find that during summer the days gradually get longer as we travel towards the poles, and the nights shorter, till in the polar regions there is one long continuing day of six months, and a six months' night. The effect of this modifies the climate of the north very much, and the long summer's days enable the corn in Norway and Sweden to ripen, which would otherwise be impossible. Indeed, it has been calculated by eminent mathematicians that, considering the length of time that the sun is shining without intermission in the northern regions, the heat of summer ought to be greater at the poles than at the equator. Though this is not the case, yet, when the rays of the sun are allowed their full effect, they have been known to set fire to forests in Norway and Sweden; and during Sir John Franklin's expedition the heat was sufficient to melt the pitch from the ships in latitude 67 degrees.

So far as the ripening of grain is concerned, however, the mean temperature of a place is not of so much consequence as the maximum; and it so happens that this considerable decrease in the mean temperature in the high latitudes arises, not so much from diminished summer's heat, as from the intense winter's cold. The maximum temperature of Moscow, for instance, is only 12 degrees below that at the equator, whilst the cold of winter is greater by 70 degrees; consequently wheat and other cereals are grown there during the short summers, and brought to perfection, and barley ripens in Lapland so far north as 70 degrees.

Mr. Harrison here offered some observations on the effect of *altitude* and *aspect* on temperature, and quoted from a paper read by Mr. Simpson to the Royal Agricultural Society.

He then proceeded to consider the influence of the ocean in moderating the effects of solar radiation upon the earth's surface. The first thing (he said) that strikes one on examining a map of the world is the immensely preponderating extent of water in the southern hemisphere and of land in the northern. The result of this is that the southern hemisphere is much milder than the northern. The northern is much more boisterous and changeable, and subject to greater variations of heat and cold. You all know that the tides are caused by the attraction of the sun and moon, the spring tides occurring when these act in conjunction, the neap or low tides when the moon is in the first and last quarters.

Now this attraction acts chiefly on the enormous mass of waters in the southern hemisphere, and were there no intervening continents, the tidal waves would travel uninterrupted round and round the earth; but the masses of land in the northern hemisphere are, as it were, drawn out into narrow promontories extending southwards. These, especially South America and Africa, interrupt these waves and divert them, so that the waves generated in the warm waters of the southern

* Mr. Parkes found that the temperature of a post-hole in Lancashire remained constant for three years at a depth of one foot below the surface.

ocean pass up the Atlantic and expend their force upon the coasts and in the polar regions. From the character of the waves (waves of translation), the water is always moving in the same direction, so that the warmer waters of the south are ever mingling with the colder ones of the higher latitudes. The waves, intercepted by Africa, however, appear to exert a greater influence on our northern climate. These, being unable to escape northwards, form hot streams or currents, which, like mighty rivers, distinctly discernible by their higher temperature, sweep through the ocean, carrying with them occasionally, into very high latitudes, the debris of the tropics.

These ocean currents are frequently of use to the mariner, and one of them, the *Gulf stream*, is especially valuable to these, our islands, its influence extending to the north of Scotland and Norway.

The effect of it upon our British Isles is most marked. To it, chiefly, Ireland owes its name of Emerald, and that the following peculiarity in England must be attributed, viz., that although the average temperature decreases towards the north from 52 deg. at Penzance to 50.86 deg. at London, 47.84 deg. at Edinbro', and to 42 deg. in the north of Scotland, yet this decrease is almost entirely owing to the greater heat of summer in the south and south-eastern parts. For instance, the temperature of the summer months in London is 63.14 deg., and in Edinburgh 58.28 deg.; and whereas London is colder than the Orkney Islands in winter, it is full 20 deg. warmer in the summer, yet the lines of equal winter temperature, instead of lying east and west across the island, run nearly north and south; so that you might travel from Dover, through London, to Worcester, Liverpool, Lancaster, to the Western Isles of Scotland, and find very little difference throughout in the temperature; or, again, from Hull, through York, Newcastle, and Edinburgh, through the western part of Scotland to the Orkneys and Shetland in the depth of winter, and not experience any very great difference in the temperature.

I must not omit to mention here the proximity of icebergs, as probably from time to time seriously affecting our climate.

You will easily understand that whilst the southern ocean is constantly, through the tidal action and the Gulf stream, supplying warm water to these northern and the polar regions, there must be a return of water from the latter towards the south. Such is the case. There is a constant flow of water southwards through Behring's Straits into the Pacific Ocean, and by the coast of Greenland, and out of Davis's Straits into the Atlantic. This water, as you would expect, is cold, as the Gulf stream is warm, and produces effects accordingly. It is probably owing to the meeting of those streams that there exist such constant fogs on the coast of Newfoundland. This northern cold stream accounts also for the ungenial climate of Labrador, which lies directly opposite to us across the Atlantic, between the same parallels of latitude as the British Isles. The climate there is so thoroughly ungenial that the Moravian Missionary Society is obliged yearly to charter a vessel to carry provisions to their missionaries.

After a few further remarks on icebergs, the lecturer proceeded:—To such influence may possibly be traced the ungenial summers of 1861 and 1862. The direction of these warm and cold currents depends upon the configuration of the land. At a comparatively recent period of the earth's history England appears to have been covered with water after it had been dry land, and inhabited by large animals, such as the elephant, rhinoceros, and hippopotamus. During that period the polar current, carrying icebergs, crossed it. These, stranding on the shoal places, or thawing as they passed along, deposited what geologists call the erratic tertiary, as they are now similarly depositing clay, stones, &c., in the sea by Newfoundland. The mountainous parts of the British Isles and of Norway would thus appear to have resembled the northern parts of America—snow-capped, and with glaciers in the valleys.

Atmosphere.—The effect of the warm or cool water of the ocean would, however, be comparatively inappreciable, were there no medium of communication between them and the land. We know from experience that in perfectly calm weather we can stand a very severe degree of cold; but let the air begin to move, and a brisk wind drive past us, we find it necessary to protect ourselves with impervious non-conducting clothing, or to take violent exercise, so as to apply to the surface of our bodies heat sufficient to meet the demand of the chilling blast. In the burning hot winds of summer, again,

more marked in character in the southern climes, sweeping thirstily over the land, and drinking up every drop of moisture to be found, we experience their robbing effects upon our system, inducing a highly feverish state of the skin. Again, exercise frequently comes to our aid; the insensible and frequently very sensible perspiration evaporating from the skin supplies the demand, and keeps our bodies cool. At other times the south-west wind comes warm and balmy, and so laden with moisture that upon everything you touch you find a deposition of moisture, and you may be nearly wetted to the skin without any rain falling. To this atmosphere, as the vehicle of conveying warmth and moisture from the ocean to the land, I beg next to draw your attention.

When from any cause the temperature of the air is lowered beyond a certain point, then moisture becomes visible, forming what we call mist. A remarkable instance of this occurs at the time I am preparing this paper—Jan. 13th, 1864. During the week ending January 9th we experienced a most severe frost, followed by a rapid thaw, with westerly winds, so warm on the evening of the 12th that it seemed like summer. During the night the wind changed, and, without violence, we have to-day a mixture of warm air brought during the last few days from the ocean, with the cold easterly borne air; and the consequence is a dense fog all the day, the mixed air being cooled down, and unable to maintain in an invisible form the moisture with which the warmer air was charged.

Such a mixture of opposing currents of air in the sky gives rise to the formation of the clouds, which are, as it were, suspended fogs. Various causes have been assigned for the particles of the cloud collecting and falling to the ground in the form of rain, such as electricity, &c. The subject is now under careful scientific examination, and will no doubt have a good deal of light thrown upon it by Mr. Glaisher.

After some further remarks on the result of Mr. Glaisher's experiments, Mr. Harrison continued:—It is sufficient for our present purpose to observe that the ocean, through evaporation, is the grand source of the moisture which is absorbed by the warm air, and carried by it in an invisible state till on being cooled from various causes it can no longer carry its load, and drops it in refreshing showers on the earth.

After considering the causes of motion in the air, the principal of which, he said, was heat, the lecturer went on to consider the effects of atmospheric currents thus produced:

You must understand (he observed) that the atmosphere, though it is apparently quite free and without intimate connexion with the earth, is not so in reality, but that as the earth turns round upon its axis the atmosphere is carried along with it—if it were otherwise there would be such a wind on the earth's surface in a direction opposite to its motion that nothing could stand upon it. Now, as the earth's rotary motion is greatest at the equator and nothing at the poles, so is that of the atmosphere that surrounds it. But this motion can neither be given suddenly nor stopped suddenly: the consequence is that the air passing from the north pole where it has no lateral motion, towards the equator where the earth has rapid lateral motion from west to east, seems to lag behind or to blow from the east, and this, combined with its motion from the pole produces a north-east wind. On the other hand, the air passing from the equator, where it has rapid motion with the earth from west to east, towards the north pole, where the earth has no lateral motion, is constantly moving faster towards the east than the earth, as it moves northward; the effect is a south-west wind.

We know pretty well from experience that these are the two winds to which we are most accustomed, varying slightly on one side or the other, the wind but for a comparatively short time remaining steadily in any other quarter. The balmy south-west wind predominates in the south-west of England. In the month of May, however, the north-east wind generally prevails, and at the same time the sun becomes very powerful; the consequence is that we experience very great variations of temperature, which are most trying to man and beast. The extremes of temperature to which the central parts of Europe are subjected suggest sufficient cause for the great changes in the

direction of the wind we experience, the points of maximum heat to which the air would rush ever shifting, and the opposing currents forming whirlwinds, which frequently indicate the coming storm. The trade winds, which blow steadily from the east over about 30° on each side of the equator, are supposed to be produced by the north-east and south-east coming from the opposite poles, mutually destroying their north and south motion, and combining to form a steady east wind. The greater part of the southern hemisphere being covered with water, the winds are much more steady and uniform than in the northern, where there is so much land, subject to so great variations of temperature in different parts, and to such extremes in summer and winter.

Mr. Harrison here recapitulated the points he had considered, and resumed :

The effects of these peculiarities of the climate upon our islands are that the western side and Ireland enjoy a higher winter temperature, but not so high a summer temperature as the eastern ; and that the westerly winds coming, heavily charged with moisture, first in contact with Cornwall, Devon, South Wales, Ireland, and Cumberland, generally mountainous, and consequently cool, drop on these by much the larger quantity of rain, and that the eastern side of our island is comparatively dry, and has generally a less cloudy sky than the western. These at once point out that the west is generally more adapted for the growth of green crops, the east for the perfecting of grain, and that in the moist districts of the west, when the summer temperature does not rise high, oats are more suitable to be grown than wheat.

But there are some other points which I would urge on your attention. Climate depends very much upon the condition of the earth's surface to retain the sun's rays, and upon what becomes of the water that falls upon it. Let me mention that there is no worse conductor of heat than water. You may apply heat for a long time to the top of a kettle before you can make it boil ; evaporation would go on from the surface, but the water below would remain comparatively cold. In the case of ordinary boiling, by heat applied to the bottom, the heat is not communicated to the mass of water by conduction, but by the heated particles expanding and floating up to the top, the colder ones falling down and in turn becoming heated.

From this you will see why the effect of the sun's rays should not be great on wet undrained land. The water lying on the surface is heated and evaporates ; but every gallon thus carried off requires as much heat as would raise 5½ gallons of water from the freezing to the boiling point : thus the earth is frequently caked on the surface, and damp and cold below. Again, the cold dry easterly winds of spring rob such land of the surface moisture and of the heat required to evaporate it, chilling the plants and giving rise to the sickly yellow appearance of the wheat, so common at that season of the year. The effect is frequently a difference of 10 degrees to 15 degrees of temperature between fields that are drained and those undrained, though similar in other respects. This undrained ground, again, being thus cooled, has a tendency to chill the air adjoining it below the temperature at which it can retain its moisture in an insensible state. Thus we see such land subject to fogs, hurtful to man and animals, and by intercepting the rays of the sun further prejudicial to vegetation.

Observe the opposite effect on well-drained land : Observe first that as the water evaporates from the ocean, it in the state of vapour contains a much larger quantity of heat than it did as water, this heat becoming what is called latent or not sensible ; this heat, when it again assumes the liquid form and falls as rain, becomes sensible ; so that in the atmosphere charged with vapour, we have, as it were, bottled up in an invisible state both rain and heat. The rain thus warmed falling upon the earth, and passing freely through it, imparts not only moisture but warmth. Of this warmth as well as moisture well drained land can take advantage, whilst to ill drained land the former is soon lost, and the latter is an enemy.

Now it seems to me that by your endeavour to consolidate the pan under your thin soles, you are trying what you can to reduce your soil to the condition of undrained land,

and that you must thereby encourage surface evaporation and consequent cooling. If it were possible, the more desirable system would seem to be, to deepen the soil by mixing this pan with some of the braeh below, and so allow the heavy rains to which we are subject to percolate freely, leaving warmth and moisture behind them.

There are three variable qualities of the atmosphere, from which result variations in the weather ; these are, its weight, temperature, and moisture ; and, by a careful observation of these, it is possible frequently to predicate the weather we are likely to have.

It is well to bear in mind that in the months of May and June, when the advantage of a moist atmosphere is so important to the success of the turnip crop, if the dew point is not more than five or six degrees below the temperature of the atmosphere, turnips may safely be sown, for though rain may not fall, yet the soil will imbibe sufficient moisture from the air for the successful germination of the plants. In November and December the air is much more saturated with moisture than in the months of February and March.

The subject is so extensive that it would afford materials for several, instead of one paper only. My endeavour has been to open the subject to you as simply as I could, and so as to induce some of our younger members especially to follow it up, and I promise them they will find it a path of abundant interest and enjoyment.

The following signs of rain, given by the celebrated Dr. Jenner, are amusing and, being founded on experience, trustworthy :—

The hollow winds begin to blow,
The clouds look black, the glass is low ;
The soot falls down, the sparrows sleep,
The spiders from their cobwebs peep ;
Last night the sun went pale to bed,
The moon in haloes hid her head ;
The boding shepherd heaves a sigh,
For, see ! a rainbow spans the sky ;
The walls are damp, the ditches smell,
Closed is the pink-eyed pimpernel.
Hark, how the chairs and tables creak !
Old Betty's bones are on the rack ;
Loud quack the ducks, the peacocks cry,
The distant hills are seeming high ;
How restless are the snorting swine,
The busy flies disturb the kine ;
Low o'er the grass the swallow wings,
The cricket, too, how sharp he sings !
Fuss on the hearth, with velvet paws,
Sits wiping o'er her whiskered jaws ;
Through the clear stream the fishes rise,
And nimbly catch the incautious flies ;
The glowworms, numerous and bright,
Illumed the dewy dell last night ;
At dusk the squalid toad was seen
Hopping and crawling o'er the green ;
The whirling wind the dust obeys,
And in the rapid eddy plays ;
The frog has changed his yellow vest,
And in a russet coat is drest ;
Though June, the air is cold, and still,
The mellow blackbird's voice is shrill ;
My dog, so altered in his taste,
Quits mutton bones, on grass to feast ;
And see you rooks, how odd their flight,
They imitate the gliding kite,
And seem precipitate to fall,
As if they felt the piercing ball :—
'Twill surely rain, I see with sorrow,
Our feast shall be put off to-morrow.

A cordial vote of thanks to Mr. Harrison, and another to the Chairman, terminated the proceedings.

THE FARMER WITH AMPLE MEANS.

BY A PRACTICAL FARMER.

My last paper was confined chiefly to the culture of the farm, and the growth of the respective farm crops. In this I intend to show how the grazing department may be conducted by a farmer with ample means, in some measure, profitably. I use the word *profitably* in a very limited sense, because I am not going to prove that any great gains can be realized by farming and grazing at all, however well every part of the business is managed. It is a slow and uncertain business, subject to every vicissitude of season, as well as of "times." How often are the hopes of the farmer cast down by the storm, or the rains, or the intense heat, or by the mildew or blight, or by premature ripening, or a hundred other contingencies! It is quite as uncertain in the grazing department. The loss of stock from casualties of various kinds, the paucity and valueless nature of the pasturage, from drought, from excessive rains, or the worthless winter keeping, owing to fickle frosts or drenching rains and snows, and the thousand and one other ills that live stock is heir to—these abundantly prove that grazing and the management of stock, as a business, is not always profitable.

The grazing department of the farm I am taking as an instance, extending over some 140 acres, I shall divide into sheep and cattle pastures. If out of this quantity some 40 acres should be adapted to the grazing of cattle exclusively, it would be deemed a tract of good grazing land, "bullock land." The 40 acres then would require about 40 head of fattening cattle, which a farmer with ample means would take care should be of the best kind, and in the most profitable order suited to the character of his land: *i. e.*, first-class grazing land will fatten oxen of great weight; but second-rate land is best adapted for heifers or smaller oxen. This is one of the items of business a grazier has to attend to, before he makes his purchases, *i. e.*, buys in his stock; and upon this, in a great measure, depends his profits. He will, therefore, keep a watchful eye upon markets and fairs, and as he meets with any lots of cattle suited to his purpose, will secure them, and place them at his winter keeping, or in some such way as will keep them from shrinking at least, till his pastures are ready for stocking. If the cattle are very forward in condition, *i. e.*, nearly fat, he will give them from four to six pounds of cake daily, so as to push them forward to take their chance for a good market. As these are drafted off, he will either "fill up" from the second-rate grass land, or purchase others in the market. Good graziers, in this way, will frequently "get off two or three runs" of cattle in the season. To do this it requires great care and first-rate judgment. The best way to accomplish this extra course is, for the grazier to be grazing a number of cattle in different stages of fattening. The fattest animals must be first put upon the best and strongest grass lands having good pasturage. These to have a liberal ration of cake, so as to get them in the best marketable condition as quickly as possible, and, as they are sent to market, the best of the remaining cattle to take their places. When the winter approaches, and the time has arrived for taking the remaining cattle into the fold-yard, the pastures should then be stocked with young steers and store sheep, in sufficient number, so that all the herbage, both rough and smooth, should be eaten off. It is highly important to ensure profitable grazing that this should be effected once at least in every year, although it may be attended with some disadvantage to the stock employed in plucking the

rough places up. The next summer's grass will be of much better quality, and yield more of it; the coarse rough places being great hindrance to the growth of the finer and best grasses.

The grass lands of the next quality he will chiefly stock with sheep and young cattle. These young cattle will most probably be taken from the grazier's own fold-yards, where they have passed the winter, and ought to have received such attention as to fit them well for the whole of the next summer's grazing, whereby they may become fatted, or at least be got so forward as to require but little further attention in the byre or fattening hovel, before being ripe for market. If the land is best qualified to fatten sheep, but few cattle will be required. The sheep should, for the most part, be fattening sheep, as such lands are well adapted for this purpose, and these sheep should be favoured with moderate rations of either cake or corn. It adds greatly to their progress, and increases the weight and value of the wool, besides giving facilities for the grazing of a larger number. It is not requisite to give a great allowance of cake or corn to either cattle or sheep on these pastures; the animals can only appropriate or take into the system profitably a moderate quantity, some animals more, some less. A liberal allowance on grass for a fattening bullock of sixty stones weight would be about six pounds of cake or seven pounds of meal daily; and for a fattening sheep of twelve stones weight, would be half-a-pound of cake, or three-quarters of a pint of peas or meal.

The poorer or weaker grass lands must be stocked with young sheep or breeding ewes with their lambs, in proportion of one ewe and lamb to two hogget sheep. A little corn or cake would aid this description of stock very considerably, but it is not so requisite as for fattening animals. As soon as the lambs are taken from the ewes, then cake or corn is almost indispensable, to prevent their re-graduating. They thus become strong enough to stand their winter keeping and the winter's cold and varied weather. Beside these general rules for stocking such lands, there are many minor additions to this practice. On the bullock lands, for instance, two or three fattening horses or colts, or a few superior sheep, are put on to graze in fields of large dimensions. On the next quality of land, milch cows, incalved heifers, weaning calves, good hogget sheep, mares with foals, young horses, &c., are interspersed; and on the inferior grass lands, yearling and other young steers and heifers, ditto colts and fillies, the farm horses, &c.—indeed, any of the ordinary class of animals not well adapted for speedy fattening. The management of these grass lands requires the best attention, to enable them to be grazed successfully. No cattle or other droppings must be permitted to lay long without "knocking." No thistles or rough tussocks must be allowed to grow; they must be kept down. Every blade of grass should be eaten, none suffered to grow coarse and unpalatable. For this purpose, mixed stock in grazing is to be preferred. Sheep, it is proverbially said, delight in young pasturage, cattle in pasturage twelve days old. It is impossible to devise a mode of stocking to suit all farms, but something like the above will suffice for an example; and the judgment of any judicious grazier would suggest such deviations as appeared desirable. Truly good sheep land ought chiefly to be grazed by sheep alone. Some of these best lands "graze beautifully"—every blade nipped off as if it had been done by a lawn-mower.

In the stocking of grass seeds upon arable farms under certain rotations of crops, the above outline would be of little avail. Grass seeds and clovers are more adapted to promote the progress of breeding sheep and the grazing of young cattle; hence considerable flocks of breeding ewes with their lambs, cows and heifers with their sucking calves, and young steers and heifers, are profitable to graze on such pasturage. Short-wooled sheep under good management may be readily fattened on good seeds. Hogget sheep of any breed will do well upon them. The wisest course, probably, is for the farmer to be provided with a requisite number of sheep, and then await the growth of his grass seeds. As they become forward and hardy, the sheep may be placed upon them, taking care not to put too many on, so as to whip up the pasture, but rather draft the stock in as the pasture appears to require them. One of the best courses to be taken with the green clover crop is to mow it, and lead it into the fold-yards to cattle. In this way, much manure of rich quality is made, and the cattle, aided by rations of meal, will thrive satisfactorily. Probably there is no method of dealing with this green clover crop equal to soiling cattle with it, in the foldyard or hovels. The number it will thus fatten is surprising, and

will amply pay for all the trouble of mowing, leading, and management. Sheep will not thrive so well in close quarters, or it would thus sustain a large number. Folding in the field is better for sheep; and one of the most economical courses is so to fold them, as to enable them to have a fresh screed of good well-grown clover daily to browse, and another screed mown for them, to be laid by the folding-fence, through which they may draw it to feed upon. In this way very much stock may be grazed, and which only a farmer with ample means can provide. In all and every case "artificial food," in the form of cake, corn, or meal, must be given them. If the season is dry and warm, linseed cake is best; if wet and cold, and the grass or clover is of a purgative character, then cotton-cake or meal is best. Great care is required to manage so that the mown food shall always be of a nutritive and fattening quality, neither too old nor too young. The cartage, too, should be carefully done, or much waste will be caused. Few animals will freely browse upon food in a dirty state, or which has been trampled upon by horses, &c.; neither must they have it laid so as to heat. All, in fact, must be administered in an attractive and enticing state, and sparingly but frequently given.

"AGRICULTURAL PUPIL WANTED!"

(Second Insertion.)

I told you that Gus and I went to visit some of the many gentlemen who wrote so disinterestedly to offer their homes and businesses for the enlightenment of my would-be-agricultural son. Well, we have had a jaunt; and though I found myself quite able to select a situation without asking your valuable judgment (as previously intended), still there may be one or two little things in our present ramble that may be worth "making a note of" in the columns of "your very influential," etc., etc., journal, of which I am, of course, either "a constant reader" or "a regular subscriber" (but you need not turn over your ledger, to see if my subscription has been punctually paid up).

Concerning the Shorthorn prize-taker, the great cattle-dealer, the good manager who has also distinguished himself in the essay prize "lists" of our Royal Society, and, again, the capital steam-plough farmer—all mentioned in my first letter—I shall say nothing just now, except that all pleased me well; and I have decided upon placing Gus with the latter, for one year's instruction in modern heavy-land tillage. But, making good use of the railways, we managed to call upon several other farmers willing to receive pupils, and also spent three nights (by appointment) at three different farm-houses, situated in counties very widely apart. Gus is a bit of a prophet, I believe; for, before arriving at each of these three places, he predicted that they would give us tongue for breakfast; and so they did. And moreover, twice out of the three times he was right in adding that the said tongue would be garnished with parsley. The third one, however, wore a serpentine adornment of yellow butter, like an interminable "tobacco-pipe made easy." Now, being "in the same line" myself, I am well aware that the family had never seen a tongue since the last good-natured father had come with his "inquiring" son to see the place, and that, this once disposed of, they will not taste another (certainly not with the pretty garnishing) till similar visitors again arrive on the same errand. A good glass of wine, too, made us chatty after dinner; and at all three houses, we finished up with "The crusts, my

dear!" after supper. But Gus (a sharp lad for Numbed One) made out from the pupil we found at the second farm, and from the groom or housemaid at the other two, that, in a regular way, wine came out only on Sundays and the liquors never came out at all. I don't object to a little extra attention to visitors (particularly when you want to produce a favourable impression of your home and family); but at the same time, the said visitors, if they have an eye to business, ought to be rightly informed as to the character of the fare likely to last through the year; and it is not fair to put on and make-believe, and hold out inducements, even of a trivial nature, which the pupil is never to enjoy. If the style of living seen by the pupil on his visit of inspection is not the usual day-by-day routine, he should be told so, in order that he may know what he is likely to get for his money.

At one farm, where the entertainment (when we called) was very hospitable, and I should think a *bona fide* sample of what Gus would have come in for, I did not like the look of a dirty yard and lumbered-up nag stable. A farmer of moderate means need not be a horse-fancier, a hunter, or one that drives a tip-top trap; but how can it conduce to the good training of a pupil, to see an old screw, not half curry-combed, up to his knees in strongly odorous litter, in a close stable, without ventilation except through a smashed window-pane; with rusty bits and a mouldy saddle hanging by the wall, and two "standings" taken up with hen-coops, so that the pet chickens of "the missis" scramble over and dirt all the hay? The good husbandman would have us ride round his farm in his "gig" (he called it), an old rickety shandry-dan (pedigree, by a costermonger's truck out of an open landau), with one wheel "three sheets in the wind," unable to "do the work" (what Gus called "akwywanick"); and creaking (I suppose to frighten the thin hairy mare through the mud).

The very next farmer we visited met us at the station with a bran new phaeton, silver-handled whip, silver-mounted harness, and a bay blood that took us up the hill and along the lane between two pheasant-covers in rare style. At the stable (with patent stalls and

fittings, &c., &c.) we saw three hunters, one belonging to a pupil; the harness-room had its stove and spicy stud-room; and we were waited on, at luncheon, by an actual "butlers." I must say, however, that the nag horses on this farm appeared in far happier circumstances than the milch cows, while the piggeries were left abominably filthy and the animals doing very badly. A lot of pert, pretty, plucky little game-bantams seemed the best off, next to the carefully groomed hunters. The mind and love of the master evidently appeared in the sporting and pleasurable rather than in the plodding business part of his profession.

Another farm we visited, where I was pleased with the well-bred cattle, the superior style of sheep, the pedigree Berkshire boar, and even prize Cochin Chinas (if that stalwart fowl with a note like a brass band, and legs oh! so tough, be worthy of admiration); but the labourers were too evidently unaccustomed to much control, from the master; and an easy-go and careless swing in their movements, seemed to me to account for much of the sloveliness apparent in the yards and buildings, for the foulness of sundry pieces of ground, and the rude condition of several gates and fences, which *might* be intended as "a blind" to stop stock. The fact was that the farmer, good in his ideas of management, a capital talker, and so on, was overdone with public business—always away from home (I heard) at some parish meeting or something of the sort. He was a member of lots of boards and committees, secretary of a farmers' club, of an agricultural association, a poor-law guardian, and likewise trustee for lots of young folks, whose parents, deeming him a good business man, or a man of mark in the district, had left him executor.

Now I do know of agriculturists who combine the good points of all now enumerated, who keep a good table, love good cheer, have a well-ordered stable, drive a spirited nag, enjoy their gallop across country now and then (perhaps finding a good customer for a two-year-old on the way), show in their cattle-sheds and yards every token of good management, diligently watch and direct a battalion of active workmen, and, in addition to all their own private business and clever marketing, are able to transact a great deal of work for other people. I know good business men,

with a heart above their own selfish interests, who display a true public spirit at boards and committees, and, while neglecting none of their duties on the farm or in the family, maintain a regular office-full of books, papers, maps, plans, and other paraphernalia of pen, ink, and pencil.

I have placed Gus, as I said, with the steam-plough farmer; he is just a man of this stamp—a thorough man of business, good judge of stock, at the same time (as is rarely the case) with a taste for machinery, and, moreover, a very gentlemanly fellow. A little too much of the "haw—well—haw—I shall be proud to initiate your son into the more fundamental principles of arable culture, and the depasturing of live stock," &c., &c. But then, I am aware that this worthy gentleman has much to be proud of, his own merits having placed him where he is, and he is the most well-informed and agreeable fellow on a winter's evening, with a prime cigar (and a certain checkmate at chess) for any agricultural or other neighbour that may drop in.

I do like a liberal intelligence in connection with sterling business qualities; and while this particular farmer (with a most ladylike wife—and so very much depends upon her—and an interesting family of four well-behaved children, and no little also depends upon them), has taken several premiums offered by his landlord for best crops of different kinds; and while his name has often appeared, both in the cattle and sheep prize lists, he was able to resent me with a neat copy of his contribution to the Royal Agricultural Journal, and referred me to a very able paper of his at a local farmers' club, reported in the *Mark Lane Express*.

I should tell you, in conclusion, that the nephew of the baronet alluded to in my first letter comes to us on Wednesday; my daughter Felicitina is in ecstasies. You can mention him to any friend that may apply to you respecting a first-class establishment for an agricultural pupil. (Don't forget the separate sitting and smoking-room for the young gentlemen, and the three packs of hounds in our neighbourhood; though, by the bye, I am forgetting that I have been rather hard upon sporting and inattention to business.)

EX-WISE-HEAD.

STATISTICAL STUDIES.

No. II.

THE WOOL TRADE.

Perhaps no branch of national commerce has undergone so prodigious an expansion of late years as this trade. The growth of population, the progress of comparatively luxurious tastes, the almost universal prevalence of broadcloth (at any rate when the British people are *endimanchés*), have contributed to this result, which, however, could not have been attained had not the marvellous progress of wool-production in Australia kept prices at a moderate point. This will be seen by grouping together the imports of sheep, lamb, and alpaca wool for the 20 years ending Dec. 31, 1863:

Year.	lbs.	Year.	lbs.
1844	65,713,761	1854	106,121,995
1845	76,813,865	1855	99,300,446
1846	65,255,462	1856	116,211,392
1847	62,592,598	1857	129,749,898
1848	70,364,847	1858	126,738,723
1849	76,768,647	1859	133,234,634
1850	74,536,778	1860	148,896,577
1851	83,311,978	1861	147,173,841
1852	98,761,458	1862	171,943,473
1853	119,306,446	1863	177,496,644

The great source of these supplies—which, it will be observed,

exhibit an increase of 170.16 per cent. in the course of the 20 years, while last year's imports were larger than in any former twelvemonth, the immense stride made in 1863 having been more than maintained in 1864—is Australia. The colony of New South Wales was not attempted until 1788, and for very many years it was only a convict settlement. In 1800, however, the exportation of wool commenced, and was carried on in a feeble and flickering fashion for the first third of the 63 years which have since elapsed—thus:

Year.	lbs.	Year.	lbs.
1800	184,240	1811	2,530
1801	364,560	1812	840
1802	99,840	1813	—
1803	5,040	1814	30,800
1804	45,920	1815	68,040
1805	336,840	1816	13,160
1806	157,920	1817	—
1807	20,720	1818	119,000
1808	35,840	1819	89,800
1809	5,920	1820	110,040
1810	13,240	1821	196,560

These figures show a very sluggish state of affairs, but the

case will be seen to have changed very materially in the second period of the 63 years, when men's minds began to be directed to the development of the vast resources of the great island-continent :

Year.	lbs.	Year.	lbs.
1822	155,120	1833	4,185,440
1823	534,620	1834	4,553,120
1824	417,480	1835	5,533,360
1825	362,820	1836	6,379,240
1826	1,240,400	1837	8,489,040
1827	353,640	1838	9,016,000
1828	1,762,880	1839	10,949,680
1829	2,059,120	1840	11,487,000
1830	2,240,840	1841	14,814,200
1831	3,256,880	1842	14,811,160
1832	2,935,240		

From 1832 to 1841 it will be observed that the deliveries of Australian wool made an uninterrupted progress ; in 1842 there was a slight check, but in the succeeding years the figures soon resumed their onward course—thus :

Year.	lbs.	Year.	lbs.
1843	17,433,780	1854	47,489,650
1844	17,602,247	1855	49,142,306
1845	24,177,317	1856	52,052,139
1846	21,789,846	1857	49,309,655
1847	26,056,815	1858	51,104,650
1848	30,034,567	1859	53,709,542
1849	35,879,171	1860	59,166,616
1850	39,018,221	1861	63,506,222
1851	41,810,117	1862	71,339,092
1852	43,197,301	1863	77,173,446
1853	47,076,010		

Fears were entertained in 1851 that the great gold discoveries of that year would paralyse the pastoral interest ; but it will be seen that they have scarcely checked its progress for an instant, and that, comparing the Australian wool exports for 1851 with those of 1863 there is an increase of 35,363,329 lbs., or 84.69 per cent. Assuming what is not at all improbable, that a similar progress is achieved during the next 12 years, the imports of Australian wool in 1875 would reach the immense aggregate of 112,536,775lbs. The fact is, the gold discoveries of Australia, so far from checking the development of the fleecy resources of the continent, have given an immense stimulus to every branch of Australian production by attracting additional population to the various settlements, increasing the demand for meat, &c. It will be interesting to note the progress of the Australian wool deliveries at the following five quinquennial periods :

Year.	lbs.	Year.	lbs.
1823	534,520	1853	47,076,010
1833	4,185,440	1863	77,173,446
1843	17,433,780		

Thus the increase in the second period over the first was 3,650,920 lbs. ; in the third over the second, 13,248,840 lbs. ; in the fourth over the third, 29,643,230 lbs. ; and in the fifth over the fourth, 30,097,436 lbs. The accelerated rate of progress here observable is due, of course, to the application of a constantly increasing amount of labour and capital to the work of wool-production in the Australias, and also to the gradual extension of settlements. Thus in 1800 only New South Wales existed as a colony ; in 1808 a settlement was effected in Tasmania ; in 1829 a rather abortive and unprofitable effort was made to turn Western Australia to some account ; in 1836 Port Philip drifted into a colony, and a rather ambitious beginning was made with South Australia ; in 1842 various settlements were formed in the north island of New Zealand ; in 1860 the Canterbury settlers broke ground in the middle island ; and in 1859, the Moreton Bay district was separated from New South Wales and placed under independent government, under the new and attractive name of Queensland. So the work of Australian colonisation constantly expands ; but if the reader will glance at a good map of Australasia, he will see that, after the lapse of nearly 80 years since a convict settlement was first formed at Port Jackson, we have still not got half round the enormous Australian littoral,

while the settlements actually formed are of a very patchy and imperfect character. It appears probable that in the course of the next 20 years colonization will advance still further towards the north of the Australian continent, while the existing settlements will become more perfect in their details ; so that it would not be at all surprising if by 1884 we attained an annual export of Australian wool of some 150,000,000 lbs. Another great source of our wool supplies is South Africa—a less favourite portion of our colonial empire, but, still, a territory possessing resources and attractions to the vigorous enterprize of the Anglo-Saxon race. The deliveries of wool from this quarter of the world have made the following progress during the last 20 years :

Year.	lbs.	Year.	lbs.
1844	2,197,143	1854	8,223,598
1845	3,512,924	1855	11,075,965
1846	2,958,457	1856	14,305,138
1847	3,477,392	1857	14,287,823
1848	3,497,250	1858	16,597,504
1849	5,377,495	1859	14,269,343
1850	5,709,529	1860	16,574,345
1851	5,816,591	1861	18,676,266
1852	6,388,726	1862	18,930,888
1853	7,221,448	1863	20,166,617

On comparing 1844 with 1863 we see progress to the extent of 17,969,474 lbs. in the latter year, the advance being at the rate of no less than 820.54 per cent. British India again is becoming an increasingly important centre of wool production, having effected the following strides in this matter in the last two decades :

Year.	lbs.	Year.	lbs.
1844	1,916,129	1854	14,965,191
1845	2,765,853	1855	14,233,535
1846	3,975,866	1856	15,386,578
1847	3,063,142	1857	19,370,741
1848	5,997,435	1858	17,333,507
1849	4,182,853	1859	14,363,403
1850	3,473,252	1860	20,214,173
1851	4,549,520	1861	19,161,004
1852	7,880,784	1862	17,959,404
1853	12,400,869	1863	20,670,111

Hence, we have an increase of 18,753,982 lbs., or 984.21 per cent, comparing 1863 with 1844. On comparing the whole wool imports in 1844 with those for 1863, we arrive at a general increase of 111,622,883 lbs. ; and to this progress Australia, the South African colonies, and British India contribute as follows :

	lbs.
Australia	59,571,199
South Africa	17,969,474
British India	18,753,982

Total..... 96,294,655

We thus arrive at the curious fact that of the whole increase the three great groups of British colonies contributed 96,294,655 lbs., and other parts of the world—Spain, Germany, South America, &c.—only 15,328,228 lbs. The woolen manufacturing industry of Great Britain has accordingly been placed on its present highly satisfactory basis through the exertions of British colonists in a great measure—a fact which philosophical dreamers who declaim against colonies would do well to remember. There is only one weak point in the present aspect of our wool supplies, viz., that we are becoming increasingly dependent upon Australia. Of a gross total of 177,496,644 lbs. received last year, 77,173,446 lbs. or 43.50 per cent. came from Australia, while in 1844 the same quarter of the world contributed 17,602,247 lbs. out of 65,713,761 lbs., or only 26.15 per cent. The disastrous experience of the cotton trade during 1861, 1862, and 1863 has shown what a fatal policy it is for any one branch of industry to depend upon one quarter of the world for its supplies of raw material ; and although in the matter of wool, as in everything else, we cordially echo the colonial watchwords "Advance Australia," we yet hope to see the Cape Colonies, India, Brazil, &c., more freely pouring in their highly acceptable contingents.

THE GOVERNMENT INSURANCE COMPANY:

BY HOWARD REED.

Amongst the new companies launched under the provisions of the Joint-Stock Companies Act of 1862, one has recently appeared which has created more sensation than them all, especially in Parliament, where it is now under discussion. The promoters are W. E. Gladstone and F. Peel, and the directors whose names figure on the prospectus are the Right Hon. the First Minister of State, the Secretaries of State for Foreign and Home affairs, and in fact every member of the Cabinet. The statements with respect to the nominal capital are rather vague, but I understand it is to be very large. The object is most important; but the means proposed to attain it are such as to ruin the success of the enterprise in the eyes of many thoughtful men.

Beyond the walls of Parliament a good deal of discussion and angry feeling is aroused by this novel plan. I am certainly opposed to it for one; and though I find myself co-operating in this passive sense with a man (Mr. George Potter) who gained an unenviable notoriety during the builders' strike in 1861 and '62, I am far from doing so on the same grounds as he does. He is inviting the working-men of various large towns to express their condemnation of this measure, as one that will enable the Government to usurp the rights of the industrial classes; but I should invite opposition to it on the ground that for the benefit of the working-men it is intended for Government to enter upon a business career, in rivalry of the subject, and in departure from that good principle which confines the Government to the protection of the people.

I am perfectly agreed with the Chancellor of the Exchequer that great numbers of the friendly societies have become insolvent, and that in consequence an inconceivable amount of privation and misery have been entailed upon the sick and aged poor. I am ready to believe that many more are in a condition bordering on insolvency; partly, no doubt, in consequence of the use of tables incorrectly calculated, and partly because they are more or less connected with public-houses, and are under the influence of publicans. But still the knowledge of these facts does not reconcile me to the abandonment of principle which he contemplates. I view that as a very dangerous step indeed; the results of which may not be immediate, but must render themselves apparent at some future period. It is a step which invades our liberties, which tends to centralization, which confers enormous power upon Government—a power that in the very nature of things must in time be subject to abuse; and it is a step the more difficult to oppose because it appeals to our immediate sympathies, and takes us on our benevolent or blind side.

I feel by no means prepared to say that, because the agricultural labourers and artisans have been victimized by fraudulent directors and managers of friendly societies or insurance companies, that henceforth this branch of business shall be carried on by Government. There is surely some middle course that would save us from this anomaly, and save us from going further than we have gone in a wrong direction. Suppose Mr. Gladstone's reasoning to prevail: on the same grounds as he thinks it right to advise Parliament to place the insurance of lives in the hands of Government, he might induce Government to step in as the family doctor; for thousands of her Majesty's subjects are annually slain by medical practitioners, certified and uncertified. The bakers practise huge frauds upon us, and get rich withal. Is the Government pre-

pared to bake genuine bread and pass guaranteed quarters over the counter in return for greasy coin? Our tea and coffee are fearfully adulterated; will Lord Palmerston undertake to provide the correct thing? Are we to expect soon to see the Government filling the capacities of wine-merchant, hotel-keeper, lawyer, railway-contractor, ship-builder, &c.? If Mr. Gladstone is consistent, and the people sufficiently pliable, I suppose it must be so. Were the Cabinet to constitute itself into a company to carry on all trade and professions in which men and women are cheated every day in the year, there would be little business left for private enterprise.

It is very properly considered to be the province of Government to protect, but not to rival the subject. Laws to regulate trade, if impartial, may be perfectly consistent with the liberty of the governed; but laws which enable the Government to become trader, as well as to make and execute the laws which regulate trade, may be deemed an evidence of the most unwarrantable and unwise interference with private rights—an interference none the less objectionable because it is countenanced by some unconstitutional and dangerous precedents.

Government is perfectly in the right when employing every constitutional means to check fraudulent trading. When so many lives depend, for instance, upon the quality of anchor-cables, it is well for a parliamentary committee to inquire into the best mode of subjecting them to official test, as is now being done; it may be advisable for the Government to check the passenger conveyance rates charged by railway companies; it is certainly proper that inspectors should be appointed to detect bad meat in its passage to the consumer, and to apprehend the vendor thereof; but it would be quite another thing if the Government, instead of attaching penalties to frauds in these cases, took upon itself the duties of cable manufacturers, railway proprietors, and butchers, and suppressed one-half the population in order to protect the other.

Mr. Gladstone justifies the course he proposes to adopt by an appeal to certain precedents. The Post-office is put forward as a notable instance of the manner in which Government can conduct a large branch of business with profit. It is a gratuitous assumption, however, to suppose that the public is better served now than it would be were the carriage and distribution of letters entrusted to private enterprise. An instance to the contrary is given by Commander Maine in his work on British Columbia. He says: "All over California and British Columbia letters or parcels are carried with perfect safety, and, all things considered, very cheaply, by means of expressmen and express men. The organization of some of these companies is most elaborate. The principal one is Wells Fargo's, which has agencies all over the world. Their office at Victoria is one of the finest buildings there; and their house in San Francisco is as large as our General Post-office. I have never known a letter sent by them miscarry. The charge for sending anywhere in California is only 5d., and so great is my faith in them that I would trust anything, in even that most insecure country, in an envelope bearing the stamp of Wells Fargo & Co.'s Express. There are several minor expresses in different parts of the country—Ballou's Fraser River Express, Jeffrey's Express, Freeman's Express—all of which appear to flourish; and so great is the trust reposed in them, and the speed with which they travel, that the miners, as yet,

prefer sending their dust by them to the Government escort. We have, in fact, yet to learn how much of recent success in this department depended upon the informing spirit of one person—now retired into private life with the blessings of his fellow-countrymen thick upon him—and whether under new guidance the results will prove the same.

It is generally allowed by economists that the country loses a considerable sum of money every year by the expensive manner in which the Government builds its ships of war and manufactures its ordnance. The *Times*, which lauds Mr. Gladstone's proposition, admits in a notice, eight days after, of Mr. Stanfeld's proposed dockyard reforms, that "there are important differences between the case of any private employer and Government. The gentleman or tradesman can select his men, know them well, dismiss them at a moment's warning, engage and discharge them at his convenience, make his own bargains with them as to work hours and conditions of payment, put out large jobs to piece-work, and feel that his eye is always on them, and the reins are always in his hand. No public establishment can ever attain to such simplicity of operation. We may as soon expect an immediate cessation from all war, as a system so admirably contrived that a reasonable valuation of all the work done in our dockyards, all the ships built and repaired, fitted and refitted, will exactly balance the aggregate expenditure." The great complaint seems to be, that the men engaged—probably superiors as well as inferiors—do not do their money's worth; and certainly, if this be the temper of those engaged in Government works, we shall best consult the interests of all concerned by restricting rather than extending the operations of the Government in such directions. Everybody seems to think the Government fair game; and were it to undertake the proposed business, I fear there would be a widespread—approaching to an absolute—corruption of the national conscience. The sharks which follow in the wake of the national ship would increase with such fearful rapidity as to constitute the very waves of the sea on which she rides.

Then, again, the post-office savings' banks are adduced as an instance of the way in which such branches of business can be conducted by Government. But it is early yet to speak confidently of that experiment. There are great evils in connexion with it, and these probably will develop in the course of time, like the seeds of many another disease, and terminate in a repeal of the whole system. Besides, as Mr. Sheridan very aptly remarked the other night: "Post-office savings' banks were pure trust; but the new assurance system would be pure trade." This is clear enough when it is borne in mind that all the savings' banks have to do is to receive money, and to be answerable for its return. They give the lowest rate of interest, and require no elaborate system of accounts. Life assurance is a different affair. In that case Government would receive small sums of money in order to return large sums at a future day. An insurer might die next week, and the Government would have to pay on his policy. The money received must be put out so as to gain a good rate of interest, 4 or 5 per cent., in order to make the transaction profitable.

Let us look at the proposition, however, apart from its infringement of the principle in question. If the plan Mr. Gladstone proposes be adopted, and be confined—which I do not suppose will be the case—to insurances of £100 only, it will break up 20,000 friendly societies, and undertake to provide for the requirements of their 3,000,000 members. Is this a consideration of secondary importance? If it is contemplated to employ the present post-office staff, and the staffs of the Poor Law Union, there must still be some large augmentation of the officials now in the pay of the Government. If Government is to enter

the lists with offices which employ 75,000 trained and skilled agents, it can hardly be expected that it can do so without taking into its pay at least half this number. I for one am alarmed at the increase of power and patronage thus to be placed at the disposal of the Government of the day. It tends to corrupt both those who exercise it, and those upon whom it is exercised. Good-bye to freedom, when the active and ambitious part of the public are converted into hangers-on to the Government, and look to it for every rise in life.

Then this insurance business is a very different thing to the conduct of a post-office, and requires a very different class of people to conduct it. It is allowed that the insurance offices and friendly societies are imposed upon to a prodigious extent by means of collusion between their agents and medical officers and insurers. This imposition would be increased a thousand-fold were the Government to usurp the function of these joint-stock companies. Everybody considers he has a right to trespass on what is deemed to be no-man's land, and the only penalty which is thought to attach to the offence is the same as that which attaches to conviction in the act of running a blockade. What I mean is, that few members of the class concerned would see any moral turpitude in the act. The managers of the post-offices, in country places at all events, are generally tradesmen, who would not be likely to sacrifice a good customer, whatever opinion they might entertain of his life, &c., for the sake of some public conscientious scruples; and medical practitioners, who, with all the present inducements to keep faith with their employers, are not unfrequently induced to make a false statement to oblige a friend or to keep a good patient, would certainly not be restrained from doing violence to their moral natures because they were the servants of Government, who would be less careful in the scrutiny of their conduct. I have known such a case as the following. The medical officer of an insurance company recommended a friend and brother-practitioner to insure at once for £1,000, since his life was so precarious that he could scarcely hope to live a year, and his wife and family would be left without provision. The usual certificates were handed in as for a good life, one premium was paid, death ensued, and the office had to cash up some £990 to the widow! If such things are done in the green tree what shall be done in the dry?

But I maintain that the Government, by undertaking to receive deposits with a view of returning them in one sum with additions at some later day, would do an incalculable mischief. The friendly societies, defective as they are in their organization, are yet extremely useful in making weekly payments to their sick members: this may be regarded as their chief value. But the bill before Parliament contemplates no interference with this branch of business, which happens to be the most unremunerative and troublesome. Mr. Gladstone proposes to abolish (such would be the virtual effect of the Government plan) these 20,000 societies, by undertaking the most profitable branch of their business, and would thus deprive the 3,000,000 members of the temporary assistance for which they looked in times of sickness. If this bill is to involve, as Lord Stanley thinks it may do, a great step towards a reduction of pauperism, it must be by the adoption and not the rejection of this most useful but profitless service. If the Government is to enter the lists with the private trader, it should be for the conduct of enterprises of great public utility, in which there is little or no profit.

But the Government, in its Annuities Bill, does not confine itself to a blow struck at the friendly societies, but undermines the whole of the insurance companies, which comprise an invested capital of £100,000,000, and a risk of £370,000,000. When the seed is once sown the disease will spread. From sums of £100 Government will soon advance to grant annuities of £200, £500, or £1,000;

and though this may be done at a loss, yet the same arguments which prevail to induce men to depart from a sound principle, will be adduced to convince the nation that *good security* is worth paying a high price for.

I am fain to believe that there is some course between the corruption of the friendly societies and insurance offices, and the usurpation by Mr. Gladstone and Company of their business. If these associations are not upon a proper footing, let a bill be introduced to place them under more effectual restraints. The system now proposed is fraught with danger to the liberties of Englishmen. I would no more discuss its provisions in the House of Commons than I would give ear to the distressful tale of the bold vagrant while his foot was thrust between the hall door and the post. No body of men constituting the ruling power ought to have the disposal of such a political engine as this would become. The power, it is true, may not be exercised for evil purposes now, or twenty years hence; but we may safely infer that there will come a time when it will. The constitutional safeguards are only preserved to us by foresight; for many measures which commend themselves to the popular mind, on account of the present remedy they

apply to defects, contain a more deadly poison than that which they are intended to counteract.

The chief difficulty in opposing this measure lies in the good intentions of those who propose it. Doubtless the Chancellor of the Exchequer thinks that he will be able to point to this as one of the brightest achievements of his admirable administration, and he will be supported by many benevolent members who will take a romantic interest in rescuing the industrial classes from the harpies who have fastened on their vitals. These benevolent people ruin many a good cause. More than half the pauperism of this country is due to their inconsiderate alms. Of their class is the tender-hearted man who passes his half-sovereign into the hand of shivering distress, and finds his children crying for bread at home. Principle is lost sight of, in the rush of feeling. It is common with such men to act first and think afterwards. I am rejoiced, however, to know that amongst our representatives there are men with wise heads as well as feeling hearts, and it is to these we must look to prevent the enactment of a law which, though intended to benefit a class, would certainly enfeeble the nation.

STEAM-PLOUGH COMPETITION AND AWARDS.

Our steam-plough and ploughing-matches, at the summer meetings of the Royal Agricultural Society, and all competitions of a similar kind, with the awards pronounced by judges and engineers, and other professional men, involve a long list of questions, that are open to practical investigation. The trials are announced to commence for the current year at an early date, on French soil, when, for the remainder of the season, the burden of the song will be anything and everything, perhaps, but fair-play to those who gain no prizes, but all blanks. Of course Newcastle will not be without a voluminous amount of smoke, in an endless variety of shades, of which we shall not attempt to give an anticipated description. But the preparations for the contest are things present, that can be seen, handled, and examined, in comparison with those of Worcester, and others now shelved as part of our steam-culture history, and about these something requires to be said practically to the purpose.

The introductory note is "ONE HUNDRED POUNDS AND A GOLD MEDAL." This is attractive enough to begin with—sufficiently so to increase the momentum of many a steam hammer, and double the "dew drops" on the sweaty brow and "one-hardened visage" of the engineer. Upon this view of the International programme a single sentence of controversy cannot be raised, and therefore we may at once leave the nine hundred and ninety-nine indescribable functions of nerve and muscle, with many times that number of engineering appliances, chemical and mechanical, unflinchingly in operation in the manufacture of the engine, implement, and working tackle that are to do the work and gain the prize, and pass on to the trial field of the manufacturer or implement maker, where the real competitive steam-ploughing-match is already being prosecuted in well-fought earnest.

The grand desideratum in the field is of course *the best steam-plough*—a question whose breadth is only equal to its length, so that it may not inaptly be compared to the quadrature of the circle.

Our intelligent reader will readily perceive that we have neither made a discovery—a *bona fide* invention of our own—nor are we about to tell a secret, in the form of a premature birth, or pronounce an untimely abortive award as to who has manufactured the best steam-plough of the season, with which he is at the present time ploughing, in his own private domain, to his entire satisfaction. The practical solution of the question at issue is a far more interesting one than even this, for it is rather a theorem than a problem—a proposition that requires a practical demonstration to prove its truth, and which may be enunciated thus:

The best ploughed land is not always a practical demon-

stration that the implement by which the work has been done is the best steam-plough; and *vice versa*, the worst ploughed land cannot be practically received as satisfactory proof that the implement by which the work was performed is therefore the worst steam-plough; or, otherwise expressed, the best steam-plough may, under certain circumstances, make the worst work.

In horse culture, these are old problems as familiar in the mouths of farmers as household words; and the practical and scientific data which they involve in agricultural engineering are equally applicable to steam-ploughs and steam culture, although they may not as yet be so well understood, owing to their complicated application. Thus, "a bad ploughman never gets a good plough" is an old proverb that will be as readily applied to the one case as to the other, for a bad hand will make bad work with a steam-plough for the same reason that he makes bad work with a horse-plough, although in both cases he may naturally feel disposed to blame the ploughs and acquit himself. Experience has long since taught farmers the practical rule for dealing effectually with such characters in horse-ploughing, and few will be at much loss how to apply it to steam-ploughing. But when we come to questions of mechanical construction, the difference between the two systems is so great, that experience has not yet had time sufficient, so to speak, to pronounce a practical award upon the merits of many of the details of the latter (steam-ploughing). On the contrary, farmers are for the present only too glad to welcome success, apart from the comparative merits of mechanical details. In other words, they pay more attention to the quality of the work done, and the awards of judges at steam-ploughing-matches, and of the opinion of such professional men as the engineers of agricultural societies, relative to the comparative merits of the implements by which the ploughing was performed, than upon any judgment of their own; for as yet they, with few exceptions, have not had a sufficient opportunity to bring their own experience into the judgment-seat, so as practically to pronounce an award upon the mechanical merits of construction of different implements and systems of tackle in applying steam as a motive power.

This want of practical experience on the part of the great body of farmers, relative to the mechanical merits of steam-ploughs, throws a very heavy and increased onerous responsibility upon the Royal Agricultural Society and other agricultural societies, and also upon the judges and officials whom they employ to pronounce judgment and award prizes; and this responsibility is still further increased when such societies—judges and consulting engineers—condescend to recommend, and publicly or privately to patronize, any peculiar

construction of implement or system of haulage. It also, we need hardly add, throws a very weighty professional obligation upon the shoulders of the agricultural press, whose obvious function is to watch the course of progress and the interests of all parties from a neutral point of view.

On the other hand, this absence of practical experience on the part of farmers, relative to the mechanical merits of the different systems of steam culture now being introduced, fully justifies the extreme caution which they are now exercising in their adoption. It also largely accounts for the small progress being made in this direction, and the lukewarm opposition, so to speak, which they are giving to the erroneous, but in high places popular, expediency of the moment. In other words, the more intelligent portion of practical farmers are not altogether satisfied with the judgment and awards, and with the private and public patronage, of agricultural societies, and their judges and consulting engineers; and as experience is still wanting to decide the question practically, their adoption, and, consequently, the progress of steam cultivation, is thus being retarded.

On the part of progress and the practical farmer, including the general interest of all parties, we thus feel called upon to say that all the steam ploughs exhibited at Worcester are so imperfect in their details of mechanism, and in some cases unsound in principle, that farmers cannot afford so great a sacrifice as to allow their manufacturers, and those who sell them, a few years' respite to make a fortune out of Frenchmen, Egyptians, and other foreigners, to say nothing of those nearer and dearer at home. There are two plain and practical reasons why the English agriculturist cannot submit to this delay; for, in the first place, he cannot spare the hard cash at present; and in the second place, improvements are needed, and these improvements in the construction of our present steam ploughs he must have, before he can adopt them.

This conclusion will no doubt be met by the counter-argument that the much-needed improvements are impossibilities, and that our advocacy of them is doing the reverse of what it intends, viz., it is retarding the cause of progress by preventing farmers from adopting the steam ploughs now in the market. But the objection thus raised has only to be seen in its true light to be tossed to the winds as selfish and absurd in the extreme, for if steam ploughs are constructed on sound principles, they can be improved afterwards, when in the hands of farmers. And when we further mention that this applies to the majority of steam implements now in use, and that as yet no patent stands in the way of the desired improvements, or extra expense of prime cost, the selfish futility of the objection will appear still more conspicuous.

But this is not all. On the contrary, under this objection something more is imperatively demanded; for all the steam ploughs now in the market are patent ones, so that farmers cannot go to the expense of improving them under a patent of their own. Indeed, so multifarious and grasping are the patents now in force, that it would require no little engineering skill to make the desired improvement without getting disagreeably into court. With the patentees and implement makers themselves it is otherwise, for they could easily make the necessary alterations without incurring any risk, or adding to the price of the article, while in some cases, if not the majority, an improved implement could be made, to the advantage of both the seller and buyer in a pecuniary sense.

One of the improvements to which we refer, and the only one we can notice at present, has reference to the "in-coming" and "outgoing" of the ploughs at the headlands, and the ploughing of hollows in any part of the field that lies below the general plane of the surface. The two sets of ploughs as now constructed are rigidly fixed together, so that each set enters and goes out of the land simultaneously, and as the one plough is behind the other they consequently make bad work. In this respect the present construction of ploughs makes a great deal worse ploughing at the headlands than the Glasgow implement (McRae's) that went to the West Indies; so that instead of making progress in improvement, our patentees and implement makers are vainly endeavouring to haul us, by their improved tackle, at the tail of the steam-horse, in a retrograde direction! To practical farmers, who were eye-

witnesses to the Glasgow experiment, this is something more abortive than hopeless; for if English manufacturers will not supply the wants of English farmers, the Scottish are clannish enough in this respect to cross the Border with what we require, and thus carry off the prize. We have no notion, however, of such a windfall to the North; at the same time it is no less our duty than interest to be upon our Border watch-towers.

The moment the Glasgow plough was got into comparatively successful working order, it was shipped to the West Indies, so that only a very few practical farmers had an opportunity of seeing it; and to those who had not this opportunity we may observe that its frame was borne on two large central wheels, with a small leading wheel in front, and similar-sized one behind, so that in principle of construction Mr. Steven's steam plough bears a close resemblance to it. But the improvements in the details of the Glasgow implement, which have been departed from, could as easily be engrafted upon Fiske's, Oliver and Chandler's, and the Howard's steam ploughs, as upon Stevens'. Of course any other implement maker can take up the general principle successfully carried out by McRae, and greatly improve its details without infringing anybody's patent, and this is doubtless the grand proposition that will ultimately carry the day in triumph if it does not do so at Newcastle.

Ought not the Royal Agricultural Society of England to give special encouragement to these and other improvements at the present time, instead of a one-sided patronage to the see-saw implement of Fowler and Co. It is evidently the chartered function of the Society to do so for more reasons than one; for improved steam ploughs of the Glasgow construction can in the first place be supplied to farmers at less money; while, in the second place, they would make better work than those made on the pseudo-balance principle, which, in Fowler's case, cannot be improved so as to make good work at the headland, owing to the counterpoise action of the up-set of ploughs taking the down-set out of the ground, when they, on the contrary, should have a downward movement in the opposite direction, so as to make the furrow slice of equal depth close up to the headland, as in horse ploughing. If it is true that the Society is recommending, through its engineer, or any of its officials, this steam-plough to the Viceroy of Egypt, it is in violation of one of its standing rules, which is, *not to pass an opinion upon any patent project*, much less to stoop so low as to tout for any patentee or implement maker, on commission!!

When the furrow wheel of the horse plough rises on to the headland at the outgoing, it takes an active downward effort of the ploughman to bring the furrow slice close up to the headland of the proper depth. With this fact practical farmers, who, like the writer, have served an apprenticeship between the stilt, must be familiar, and to this downward effort we beg to draw their special attention, because the facts of the case, in the example of the horse plough with which they are experimentally acquainted, are a close parallel to those of the improved steam plough we are advocating, and directly opposite to the counterpoise action of Fowler's steam plough, so zealously patronised by the consulting engineer of the Royal Agricultural Society, as if it were the fundamental principle upon which the success of modern steam-ploughing depends, and also directly opposite to all the steam ploughs constructed in imitation of Fowler's. If farmers will examine closely Fowler's plough when it arrives at the outgoing headland, they cannot fail to perceive the cardinal objection to which we refer, as the cause of the bad work of which we and they generally justly complain. And the objection, it must further be remembered, is not confined to the headland, for in ploughing sloping and uneven surface ground it is impossible to make good work when the set of ploughs are rigidly fixed so as to sole in one plane. In ploughing such uneven surfaces farmers know how to handle the horse plough. Experience has taught them this lesson, and a similar experience will teach them in due time that the same mechanical laws must be respected and attended to in steam-ploughing.

Again, it was our own opinion, and also the opinion of all the practical farmers and engineers with whom we conversed in Glasgow and the neighbourhood at the time of

the trial, that ploughmen would soon learn to lower and raise McBae's ploughs, when required, with as much ease and dexterity as in the case of the horse plough, while many mechanical aids were suggested to abridge labour and thereby assist them.

Is not this the season of the year when agricultural societies, with their consulting engineers and judges, implement makers, agriculturists, and all interested, should be experimentally training steam-ploughmen how to manage steam-ploughs constructed on improved principles, as above suggested? The proposition has certainly many things to recommend it, in preference to the present erroneous system of giving prizes to implements constructed on principles diametrically opposite to the cause of progress, and the function of the societies that award merit where none is due, and withhold it to implements whose details of construction could easily be improved, and which doubtless would soon be improved, were the Royal Agricultural Society to take up the cause of progress in

accordance with the spirit of its charter, and were its consulting engineer to discharge with equal fidelity the responsibility reposed in him. We cannot see how a different conclusion can consistently be arrived at; for to train ploughmen to make superior work with implements constructed on erroneous principles, so as to be able to get rid of them to amateur farmers, viceroys, &c., approaches nearer to the maxim of the light-fingered gentry, who silyly help themselves to the contents of peoples' pockets, than to the chartered rights and privileges of any agricultural society with which we are acquainted. Such a system is altogether discreditable and unworthy of the present age; for the moment a single flaw is found in the principle of a new machine, such as the counterpoise action of Fowler's steam-plough at the headland, that moment it should be thrown aside, until the objectionable flaw is removed; and the same is true of Howards' and other ploughs, so long as they are rigidly fixed in sets.

ENGINEER.

SEWAGE IRRIGATION.

SIR,—The time is gradually approaching when thinking men who now know something of the natural laws and chemistry of agriculture will no longer abhor their own excreta, but will look upon them as the only reliable means for producing their future food. With the existing sentiments on this question, every man who dares to shock the false delicacy of the public by an appeal to their reason and common sense must expect to incur a certain amount of obloquy, ridicule, censure, contempt, or pity—but a stern sense of public duty and general welfare will give him courage and support. I feel convinced that the time will come, and is coming, when we shall be compelled to educate our children to regard their excreta as a treasure worth preserving, and too precious to be wasted. This is the practice in Japan and China, where, as a consequence, the people have increased and endured beyond any nation on earth. The reason is obvious. With their increase of population brings increase of manure, and consequently increase of food, without recourse to foreign imports of either corn or manure. Cause and effect thus follow each other in logical sequence.

The population of China is estimated at 412 millions (nearly half the world's population); of Japan, I believe, 80 millions. In Great Britain, owing to our neglect and waste of human excreta, increased population does not bring increased food; on the contrary, we become annually more and more dependent on foreign supplies, not only of food but of costly manures. We pay millions annually for Peruvian birds' dung, and throw away our own at our own doors. Is this reasonable or consistent with true commercial principles?

What should we say if our farmers, who depend for the production of their crops on the droppings from their 40 millions of sheep, were to divert all these droppings to the nearest stream or rivulet; and yet the waste of the excreta from our 80 millions of population is as great a folly, I had almost said as great a crime. That profound and rare philosopher, Baron Liebig, has, in his never to be sufficiently appreciated works, unveiled and exhibited to us for the first time natural laws of agriculture, and if we believe in those laws and listen to his advice there will soon be an end to that cruel waste of man's vitality, which flows in golden streams through our sewers to pollute our rivers.

It is curious to observe the amount of pertinacious disbelief and opposition that have been created by the enunciation of that great man's theories; but it ought not to surprise us when we remember that every new truth has had to pass through the same ordeal. Galileo, Harvey, Jenner, and a hundred other good and great men, in ancient and modern times, have all felt the force of ignorance and prejudice; but truth has ultimately prevailed. So it will be with what is called the sewage question.

The great dilution of our sewage is looked upon as a fatal objection to its economic use. There never was a greater error. Has not science revealed to us that the earth can and does abstract and arrest from the filtering fluid all those portions of it that are suited for the growth of plants? The

potash, phosphate of lime, and ammonia, forsake the sewage water, and cling affectionately to those earthy granules from which men and animals, by an All-wise Providence, obtain their food. Sixty or seventy years ago we had no sewage or sewers, nor steam-power to avail of; but now mighty steam makes child's play of draining a swamp or emptying a sewer.

Sewage croakers who plead expense as an objection to the economical use of sewage should learn, if they do not know, that 112 lbs. of coal, value 1s., will, in a Cornish engine, so multiply its weight or power, that it will lift or raise 105,000,000 lbs. of sewage or water 1 foot high. This is the ordinary duty performance of our water companies' best pumping engines, and thus we have the question settled so far as one important expense goes. There only remains the laying down pipes to convey it to the land, so soon as people can be brought to believe that town sewage is the very best of manure, and well worth paying for. To instil this belief into the agricultural mind is the most difficult part of the affair; witness the apathy in regard to the wasteful washings of farm-yard manure, the strong tea going unheeded down the brooks after heavy rains.

In order to give town sewage its full value we have only to add to it as much superphosphate of lime as is contained in the bones which we do not eat, and which, therefore, do not go into our sewers. This was clearly explained by Baron Liebig in his recently published letter, giving the value of town sewage with phosphates at 4d. per ton, without phosphates only 1½d. per ton. The want of phosphate of lime in sewage or manure is like the want of mortar in house building—all the other elements or materials present are, by its absence, rendered unavailable. This is another of Liebig's great theories and truths.

We have all heard of the sewage meadows of Edinburgh, which, owing to the heavy dressings of town sewage, are now let on an average of £27 per acre per annum, and we know that the great cow-keeping firm in Glasgow, acting upon the advice of that good friend to agriculture, the late James Smith, of Deanston, pump the sewage from their cows to their farm out of town. But I will now proceed to detail a very important instance of the value and profit of town sewage.

This undertaking, being so recent, so accessible (only nine miles by rail from London), and so cheaply and effectively carried out, is likely, as an example, to have a great influence on the sewage question.

On the 23rd of June, 1862 (by the kind permission of Mr. Marriage), I devoted some hours to a close inspection of the Beddington Meadows (800 acres), which receive continually, night and day, winter and summer, over a portion of their area, the sewage from 18,000 of the inhabitants of Croydon. The fiscal matters of this population are diluted by a water supply of more than a million of gallons daily, often increased by springs and rainfall to 2,000,000 gallons. The conditions on which it is granted are that the sewage shall leave Mr. Marriage's farm nearly as clear and bright as spring water. This actually takes place,

This application of town sewage to the land arose from no voluntary desire to benefit the soil, but from stern compulsion. In the first instance, the Board of Health turned it into the river, the beautiful and pellucid little Wandie, a trout stream.

Law and Chancery suits were instituted at an enormous cost: a gentleman who holds a mill on the stream told me that he alone had expended £7,000 in law. And ultimately the Board of Health were compelled to hire 300 acres of land at £1 per acre, the previous rental having been only 30s. They then let it at an increased rental for a term of years to the present occupier—Mr. Marriage, an Essex farmer, who has expended some £6, or more per acre, in pulling down 40 acres of wood, grubbing an immense area of rough old banks and fences, levelling, cutting carriers and gutters, and otherwise preparing the land to receive the sewage. Out of this sum the Board of Health have allowed him £3 per acre. The land is favourably situated, being tolerably level, falling as the river falls. It is also very light and loose, resting on gravel, and self-drained. Mr. Marriage flooded the wood with sewage, and then pulled down the trees with a steam engine, the chain being attached to the tree about 18 feet from the ground. This flooding destroyed the numerous rabbits that infested the farm. Mr. Marriage, who is a judicious as well as enterprising man, entered upon this occupation in 1861, and has now laid nearly the whole 300 acres under sewage. This has been no easy task, but the work is done most economically and efficiently.

An open ditch of small dimension, with stops or sluices, communicates with carriers along the head of each field; from this carrier the sewage flows into open gutters, 12 inches deep, and 8 or 9 inches wide, 50 feet from each other, and running from top to bottom of the field. One man attends to the whole, placing the boards or stops at proper intervals to divert the sewage equally over the soil. From 30 to 40 acres are always under irrigation, the cost of attendance being 1d. per acre for labour for each irrigation. Sometimes the rye-grass is flooded again when 18 inches to 2 or 3 feet high, if it appears to require it. It grows very strong and green near the gutters, and this guides one, or rather warns one, where to step over them. Those who see great difficulties about sewage would be surprised at the simplicity of the operation. The sewage flows from the town down to the Board of Health sewage works, where the solid is separated from the fluid, by passing through perforated plates and gravel-beds. The fluids then come to Mr. Marriage's farm in an open cutting. There is nothing to shock a farmer's nerves; and although the weather was warm, there was only a faint and slightly disagreeable smell on those fields from which the sewage had been recently withdrawn.

The arable land was in a wretchedly-neglected condition, covered with docks, couch-grass, and other pernicious weeds, which Mr. Marriage naturally concluded would impede the growth of his young Italian grass. To his surprise and joy, however, the rapidly-growing rye-grass, under the influence of sewage, first smothered and then ate up all its opponents. No other vegetation can exist under the dense mass of this Italian rye-grass, looking like a solid and impenetrable wall from 3 to 4 feet 6 inches high. The second cut (from April 22 to June 22) was of that height, and at least 9 to 10 tons per acre. In the hot and dry month of July the crop grew much less vigorously, showing a desire to run to seed. With more cloudy weather and shorter days its strength returns. The first cutting takes place in March, the last in November. The total cuttings yield from 25 to 30 tons per acre, according to season. This, if converted into hay, would give 10 to 12 tons per acre. During the spring months enough is sold daily to feed about 900 cows, in addition to a great number of cattle and horses grazed on the farm. This large supply affects the London hay market. The spring growth is so rapid and simultaneous that it becomes necessary to make some into hay, although this is rendered a difficult operation, owing to the great crop, and also to the rapid growth of the following crop.

The price received on the field is 17s. per ton for the green grass. About 25 horses are employed in carting to London, where it is sold at 25s. per ton. Cowkeepers and others from many miles around, come to the farm for supplies. The grasses are of a very fattening quality, as evidenced by the

peculiar glossy coats and healthy appearance and well-filled outlines of the numerous grazing animals ready for the butcher. No other food is given but grass; and they eat it quite bare before the irrigation is turned on. Pasture and Italian grass benefit alike by the sewage, the former being rendered a rich and close sward by the application of sewage. Many head of cattle are grazed on the pastures during winter, and do well. Forty acres of mangel-wurzel are grown annually.

On the whole, this undertaking gives unmistakable evidence of the value of town sewage; and although, after passing over Mr. Marriage's land, the sewage appears to be water, I imagine that it must still be of considerable value, if applied to other land.

I cannot conclude this paper without thanking Mr. Marriage for his public spirit and kindness in permitting an inspection of his operations.

J. J. MROHI.

Tiptree Hall, March, 1864.

P.S.—I may add that the sanitary condition of the neighbourhood of the farm is good, and that the alarm originally existing has now passed away. I would remark that, from experience, I find that when farmyard manure is converted into sewage by being very largely diluted, and applied like rain, its effect on the growth of plants is much more rapid, and the return for the quantity of manure applied is more immediate, than the slow action of what is called solid manure.

It is the solubility and divisibility of guano that tends to produce a quick return. The same principle holds good with sewage.

I annex Mr. Marriage's letter to me, just received:

"Grassmere, near Mitcham, Surrey,
March 12, 1864.

"DEAR SIR,—In answer to your queries, I may inform you that 17s. per ton is the price I obtain for my grass in the field.

"I charge 25s. per ton, delivered in London; but as so much of this is made up with the expense of cartage, &c., therefore the most correct estimate, and the one that most fairly states the value, is as above, viz., 17s. per ton in the field.

"You know that I have hired about 300 acres of land, and apply the sewage of Croydon to it; that it is a great stimulant to the growth of vegetation, especially to grass, producing a crop much earlier in the season than any other method, and continuing in on much later, also through the autumn; that grass so produced possesses great feeding qualities; that sewage-water so passed over the land is rendered not only clear and free from feculent matter, but will not create a nuisance if the land is situated not immediately in the neighbourhood of habitations. This latter remark I make purely on the ground that under any circumstances the application of the purest water to the soil, will of necessity produce a dampness in the earth, and perhaps influence the air, and would not be conducive to health.

"I remain, dear Sir, yours very truly,

"JOHN MARRIAGE."

The following facts, which I ascertained from reliable sources, settle the question of the practicability of applying town sewage to the soil:

"An iron pipe of 4 feet in diameter, having a fall of 5 feet per mile, conveys from Loch Katrine to Glasgow (40 miles), 22½ million gallons of water every 24 hours. The cost of the 4-foot pipes, including bridges and other necessary works, was £10 18s. per yard. This was carried out for the Corporation Water Works, Glasgow."

The largest daily water supply to London is 100 millions of gallons during summer. Much of this is wasted and evaporated by street watering, boiling, steaming, &c. Therefore four of the Glasgow pipes would reconvey all the water and sewage to the country. Oh, but then there is the rainfall! Well, Mr. Basalgette, in a paper read in January, 1857, says that in 1855 there were—

226 dry days in the year,
90 days fraction to 1-10th of an inch of rain,
21 days 1-10th to 1-5th of an inch,
28 days heavy rainfalls.

ON THE COMPARATIVE VALUE OF MANURE MADE WITH AND WITHOUT COVER.

BY ROBERT SCOT SKIRVING, CAMPTOWN, EAST LothIAN.

[Premium.—The Gold Medal.]

The experiments, an account of which follows, were made during the years 1860 and 1861, upon a field which was cropped the first of these seasons with potatoes, and the second with wheat.

The soil upon which the experiment was made is a lightish loam, of good quality, with a considerable slope towards the north. Previous to the potato crop of 1860, it had carried oats, following two years' pasture. The experimenter's first business was to secure good dung, which had been made in every respect in the same manner, with the exception of the circumstance of cover. For this purpose, a shed and court were selected, in which a lot of six cattle had been fed off upon turnips, oilcake having been added during the last six weeks they were there. As the one portion was entirely exposed to rain, whilst the other was perfectly excluded from it, and as the litter used and the food consumed were identical, the necessary conditions were satisfactorily obtained. Besides the two acres devoted to the experiment, a third was added for the sake of further comparison, which was manured with half the weight of dung and with five cwt. of portable manure, which consisted of guano and dissolved bones in equal quantities. The dung used on this acre was from the open court. The ground experimented on was as equal in quality as could be desired; and it would be difficult to assign a superiority to any one of the three acres. The potatoes used were regents, which were planted on the 12th of April—a long winter and a backward spring having delayed all the operations of seed-time. The dung, which was in good condition, was applied at the period of planting. The three lots were manured in the following manner:—

Lot 1. 20 tons of dung per imperial acre—from open court.
Lot 2. 20 tons of dung per imperial acre—from covered shed.
Lot 3. 10 tons dung from open court, and a mixture of 2½ cwt. Peruvian guano and 2½ cwt. dissolved bones.

The weather and the state of the soil enabled the seed to be planted and the land worked in a satisfactory manner. During summer, all the potatoes looked well, but the acre manured with the covered dung had much more luxuriant tops than the others. In July this was particularly obvious, the stems showing in a very marked manner when looked at even from a considerable distance. They also preserved their vigour to a late period; and to such an extent was this the case, that when, on the 14th October, the shaws of the covered-shed acre and of the mixed-manure acre were cut off, preparatory to lifting the crop, it was not found necessary to cut those of the open-court acre, so much had they withered away. This conspicuous difference in the lots was indeed the most marked disparity exhibited in any respect by the two sets of experiments.

The potatoes were lifted on the 1st November. They were all a good crop, and were valued by an extensive dealer as worth £35 per Scotch acre. Portions of the field (which is nearly 40 acres in extent) were not so good, and the whole were sold, as they grew, at £30 per Scotch acre. It must be noted that the summer of 1860 was much drier in the south-east of Scotland than in many other districts, and that there the potato crop was a very good one, and sold at high prices. The crop was carefully lifted with the fork, and the produce of each acre accurately measured, with the following results:—

	Tons.	Cwt.	Qr.	St.	Lb.	
Lot 1. Open court	6	6	0	0	0	per imp. acre.
Lot 2. Covered shed	7	8	2	1	10	do.
Lot 3. Mixed manure	7	9	1	1	6	do.

These weights represent the total produce per imperial

acre. Each lot was pitted separately; and, when ultimately sent by the purchaser to London, a note was made of the quantity actually turned out to market, as well as the amount of refuse in each. This note was, unfortunately, lost by a labourer; but I had seen there was a very small percentage of inferior potatoes in all the lots, and that the proportion in each did not differ in any material degree. The difference, indeed, between the two principal lots (the covered and uncovered dung) was not appreciable; but the potatoes produced by the mixed manures were slightly smaller in size than the other two. In consequence of this, the amount of first-class potatoes fit for the London market, produced by the covered-shed dung, was slightly in excess of the mixed-manure lot. There was no disease in the field.

It will be seen from the above that the dung made under cover produced 1 ton 2 cwt. 2 qrs. 1 st. 10lb. more potatoes per imperial acre than that made in the open court; whilst the acre manured with dung and guano, &c., while it produced a crop slightly in excess of the covered-shed lot in the first instance, lost that small superiority in the process of sorting for market, and may, for all practical purposes, be accounted of equal value.

I have little doubt that in wet seasons, and in districts where the amount of rainfall is large, the superiority of manure made under cover will be still more marked; whilst in pastoral districts, where the economizing of litter is an object, a double advantage will be secured. On the other hand, where a purely arable system of agriculture is followed, and where it is often necessary to trample down as much straw as possible, it might be inexpedient to construct farm offices with a view to the exclusion of rain from the cattle courts. Besides, most farmers are of opinion that cattle thrive better in well-constructed sheds, with open courts, than in boxes or byres. On ploughing the ground after the potato crop was removed, I observed that the covered dung was decidedly more visible than the uncovered; and I inferred from thence that there was a greater amount of unexhausted manure in the one acre than in the other.

I now proceed to give an account of the wheat crop which followed the potatoes.

The variety used was that known by the several names of Mongoeswells, Lady Hall's, &c.—a white wheat, which is cultivated to considerable extent.

It was sown, under favourable circumstances, on the 22nd of November, and no dung or top-dressing was at any time applied, in order that the action of manure in the soil might remain perfectly undisturbed. During autumn and winter, I cannot say that I observed any difference in the braid of the three acres; but, as the season advanced, I saw, with regret, that the experiment was disturbed to a material degree by a cause which cannot in any way be attributed to the mode of manuring. The whole northern portion of the field had "thrown out," as it is termed, and the wheat, to a very considerable extent, had died and become blanky. The line of this comparative failure, which was distinctly marked, reached the experiment, and extended over one-fourth of the open-court acre, whilst it did not reach the other two lots.

The crop of 1862 has proved so worthless that it makes that which preceded it appear good by comparison; yet the wheat crop of 1861 was considered at the time a very inferior one. The field which was the subject of this experiment produced a fair return; and it happened to be the only one possessed by the experimenter which did so.

It was my wish to have had the total produce of each of the three acres—straw as well as the grain—accurately weighed; but, there being no means of doing so in the

immediate neighbourhood, I was reluctantly compelled, during the bustle of harvest, to content myself by sending the produce of an equal number of square yards to be weighed. The following figures may indicate pretty exactly the relative weights of the respective crops:—

Portion from open-court dung ..	..	15½ cwt.
Do. from covered-shed dung ..	..	17 "
Do. from mixed manure ..	..	16 "

The measurement of the above equal portions was taken where the "throwing out" had not so distinctly marked itself on the open-court acre.

The wheat was stooked separately, and, shortly after being "carried," was thrashed, weighed, and measured. The following are the results:—

WEIGHT.

Weight of open-court lot per bushel ..	..	60½ lb.
Weight of covered-shed lot per do. ..	..	61 "
Weight of mixed-manure lot per do. ..	..	60½ "

QUANTITY PER IMPERIAL ACRE.

		Bush.	p. gal.	qt.	pt.	gi.
No. 1. Open court, good grain ..	..	29	0	0	0	1 2
" " grey do., ..	..	1 8	1 8	1 8	1 2	
		31	0	0	0	1 0
No. 2. Covered shed, good grain ..	..	33	0	0	2	1 2
" " grey do. ..	..	2 2	0	8	1	2
		35	2	1	2	1 0
No. 3. Mixed manure, good grain ..	..	30	1	1	0	1 0
" " grey do. ..	..	1 8	1	8	1	2
		32	1	1	0	2

I cannot give any trustworthy estimate of how much the open-court acre was damaged by the "throwing out;" but my opinion is that, but for that circumstance, it would have been little inferior to the other; and the experiment seemed to indicate—contrary to my expectation when the wheat was sown—that a second season had tended to equalize in a great degree the power of the two lots of dung.

This accident is one of many to which agricultural experiments, of every description, are constantly liable; and I think it will not be disputed that many trials, made during various seasons, must be undertaken before results can be definitely and satisfactorily ascertained. So far, however, as this experiment, conducted with all the care it was in my power to bestow, can be founded on, the results seem clearly to indicate that dung made under cover has, even in a comparatively dry climate, a very decided advantage during the first season over that made in open courts; whilst the second year still shows a superiority, though not in so marked a degree.—*Journal of Agriculture.*

SHEEP DIPS AND SALVES.

The enhanced value of wool consequent upon the limited supplies of cotton has induced farmers generally to bestow more attention upon materials for dressing the fleeces of sheep. Several of the specifics for dressing sheep are patented, and such cannot be manufactured, sold, or used without incurring liabilities, which might amount to a considerable sum as damages with expenses, if parties so imitating or using the specifics without the sanction of the patentees are taken into Court. The most generally known of the specifics which are patented are Bigg's dip, composed of arsenic, potash, and sulphur; Macdougall's dip, which is composed of acids obtained from coal tar and potash or soda. There are other dips and salves in use. One of the most common is olive oil, sold under dif-

ferent names. The most generally used being Gallipoli oil, which is the name of the port in Italy where the export trade in oil is very extensive. The time-honoured salve, tar and butter, is being gradually abandoned; other salves being substituted with advantage both as regards the higher prices obtained for the wool, and the improved condition and general health of the sheep.

The following account of experiments, undertaken in different counties, has been handed to us for publication. As the subject of sheep dips and salves is a most important one, readers would doubtless be obliged were other parties who have made experiments to forward an account of these, with full information as to the dip and salves used. Mr. Reid has forwarded for our private information as to the materials of which the dips are composed. The smearing composition is composed of—No. 1, tallow (refined), castor oil, and butter; No. 2, tallow (refined), whale oil, and butter in proper proportions to laying on.

GENERAL AVERAGE OF WEIGHT AND PRICE OF CHEVIOT HILL FLEECES, in Roxburghshire, Ayrshire, Argyleshire, Inverness-shire, Sutherland, and Caithness, for Clip of 1869, where the sheep has been prepared for winter with the undermentioned applications, viz.—Reid's vegetable oil bathing mixture, smear of tar and butter, preparation from arsenic, and Reid's white smear:—

UNWASHED FLEECES WOOL.

Oil dip.	6 fleeces required to make one stone of 24 lbs., or 4 lb. per fleece. Cheviot hogg wool sold at 20½d. per lb.	6s. 9d.
		Deduct expense of bathing .....	0 3
		6s. 6d.
Tar and Butter Smear.	4 fleeces required to make 1 stone of 24 lbs., or 6 lbs. per fleece. Cheviot hogg wool sold at 14d.	7s. 6d.
		Deduct expense of smearing ... 0 9	6 3
3d. per sheep in favour of an oil dip. .		0 3
Arsenic Dip.	2½ lb. fleece Cheviot hogg wool sold at 20½d. per lb.	5 10
		Deduct expense of dipping .....	0 0½
		5 9½
Reid's White Smear.	4 fleeces required to make one stone of 24 lbs., 6 lb. per fleece. Cheviot hogg wool sold at 18d. per lb.	9 0
		Deduct expense of smearing ... 1 0
2s. 2½d. of white smear		2 2½

EXAMPLE OF WASHED CHEVIOT.

Cheviot hogg wool from Morvora, prepared with Reid's white smear, 5 lb. per fleece, sold at 22d. per lb.	2s. 2d.	
Deduct expense of smearing	1 0	
		2 3
Cheviot hogg wool smeared with tar and butter from Sutherland, 5 lb. per fleece, sold at 16½d. per lb.	6s. 10½d.	
Deduct expense of smearing	0 9	
		6 1½
2s. 0½d. in favour of white smear	2 0½	

EXAMPLE OF BALNAGOWN CLIP OF HALF-BREED BURN STROCK HOGGS prepared with Reid's smear, made an average throughout of 7 lbs. per fleece, sold at June sale, at 21½d. per lb.

12 8½	
Deduct expense of smearing	1 0
11 8½	

EXAMPLE OF BALNAGOWN CLIP OF HALF-BREED WEDDER STROCK HOGGS prepared with usual dip, made an average throughout of 5 lb. per fleece, sold at June sale at 22½d. per lb.

9s. 4½d.	
Deduct expense of dip	0 1½
9 3	

2s. 5½d. in favour of smear

2 5½

—North British Agriculturalist.

THE AGRICULTURAL CONDITION OF IRELAND.

The agricultural condition of Ireland has occupied a large share of public attention lately, and much has been written regarding it on both sides of the channel. It is a subject that has often been noticed in our columns, and without looking at it in any political aspect, we may bring prominently forward a few points calculated to throw some light upon the inquiry. A recent number of the *Quarterly Journal of Agriculture* opened up the subject, whilst several pamphlets have also discussed it in its various bearings.

In an official report recently published by Dr. Hancock, "On the supposed progressive Decline of Irish Prosperity," he enters largely into the various operating causes. He states that 40 per cent. of the Irish population have emigrated to Great Britain in the last quarter of a century. The failure of the potato crop is universally known to have been the primary cause of the diminution of the population. Emigration, however, had been going on at an extensive rate before 1846, caused by insufficiency of wages at home, and consequent misery. The Committee for inquiring into the condition of the Irish Poor, recommended emigration so far back as 1836. The remittances from North America show the voluntary character and beneficial effects of the emigration, and when the Irish population in the United States is so prosperous, it is idle to deplore emigration as necessarily a calamity.

The increased emigration in the last two years, notwithstanding the continuance of American warfare and its concomitant horrors, is a proof of pressure from the unfavourable seasons of 1860 and 1861. What, it has been asked, would be the condition of Ireland now, after three successive seasons of comparative unproductiveness, if its population was at its maximum (upwards of eight millions) of 1841? The Irish emigration to the United States is in a great degree due to the operation of social and economical laws, with which it would be absurd to attempt to interfere.

But it must be remembered that it is chiefly the agricultural class which emigrates, and that, relatively to the area of cultivated land, the agricultural population of Ireland is still denser than that of England. In the rural districts of England the average of available acres per head is, upon an estimate which probably approaches the truth, from 8 to 5½; in Ireland it does not exceed 2½ acres—a difference which is of itself sufficient to account for the different rates of emigration. In Germany, again, the prevalent system of peasant proprietorship at once diminishes the necessity of emigration, and in an almost incalculable degree strengthens the force of the home tie. In the words of the *Edinburgh Review*, "It is rather a feature of the age than of any particular country, and has been conspicuously exhibited by some of the most advanced nations of Europe. The commencement of the movement may be placed about the end of the first quarter of the present century. At that time Great Britain, Ireland, and Germany—the countries in which it has since assumed its most colossal dimensions—did not send from their collective bounds an annual aggregate of more than 20,000 persons. But from that point the tide rose, and with such rapidity and power that within another quarter of a century the stream of 20,000 had swollen to 500,000—a magnitude which it maintained for some six years in succession, and to which, though it has since considerably declined, there are symptoms that it may approach once more. The proportions in which the three countries,

Great Britain, Ireland, and Germany, contributed to the stream when at its highest, were not very unequal: they may be taken to be very nearly as follows:—

Ireland	...	...	210,000
Germany	...	...	155,000
Great Britain	...	...	135,000

Total annual emigration from the }
three countries (in round }
numbers) ... } 500,000

These, however, have not been the only countries in which emigration has received an extraordinary impulse in recent years, in a less degree, but still sensibly, Spain, Belgium, Scandinavia, and even France have felt the emigrating influence."

Of course the proportion of emigrants to the total population was far larger in Ireland than in either Germany or Great Britain. A drain of 210,000 persons yearly from a population of six or seven millions, and of 155,000 from a population of forty millions, or of 135,000 from a population of twenty millions, are scarcely to be ever named together. A well informed and impartial Irish journal, looking dispassionately at the subject, observes that it cannot be concealed that the Irish emigrant seeks to throw off his allegiance to the English crown, while the English and Scotch emigrants are anxious to retain theirs. The former, with the rarest exceptions, wend their way to the United States; the great bulk of the latter turn their steps towards those of our colonies which are still dependencies.

The amount of emigration from Ireland may not, under existing political and social arrangements, be in excess of what is required for the industrial improvement of the country. But the mere amount of emigration tells us very little. When we are told that during the year 1863 probably no less than 120,000 persons left these shores, the information seems and is precise and definite enough. But it is obvious that each item of this total may possess a very different value. The child in arms and the worn out old man, each go to swell the sum not less than the labourer in the first vigour of youth or in the strength of mature manhood. Arithmetical totals of this sort tell us very little—much less, at any rate, than the accurate inquirer and the sound reasoner will desire to know. It does not enable us to estimate either our loss or gain. If the emigration carries away those who have not yet reached, or who are long passed the age of work in due proportion with the efficient labourers; if the several constituents of the family are fairly represented in the passengers of each emigrant ship, we have no cause to complain. But there is reason to believe that this is not the case. Grounds have lately been shown for believing that children and the aged are left behind, while the young and middle-age take their departure. In other words, we lose the producers of wealth, and retain only its consumers.

Let us consider next the quantity of land under culture. The number of acres under crops of all kinds increased from 5,238,275 acres in 1847, to 5,970,139 in 1860. Subsequently there has been a decrease, but yet in 1862 there were half a million acres more under crops than in 1847. Wheat culture has declined from 743,871 acres to 357,816 acres, which is a natural result of the proved inferiority of the climate of Ireland for wheat-growing, and its much greater suitability to other crops. Wheat is the crop of all others in the growth of which the country has the least natural advantages, and which can be most easily

replaced by supplies from abroad. Barley is of very limited culture, and the acreage of oats has varied but little in this series of years, averaging about two million acres in the last seven years. The decrease in cereals has been concurrent with the increase of potatoes, which makes the united acreage of both little less than it was in 1847. Last year the productiveness of the potato advanced to a very high rate. The acreage of turnips is about the same—400,000 acres, which is the maximum extent reached within the period of sixteen years. There has been a great decrease in the weight of produce in all the foregoing crops for the last seven years, which is entirely attributable to unpropitious seasons. Notwithstanding the great efforts made to promote the culture of flax, especially in the south, the total average is still very insignificant.

As the extent of land generally under culture at the present period is greater than it was in 1847, when the population was so much above the present number, and far better cultivated with fewer labourers, it is clear that the former numbers were redundant and cumberers of the land, under the demoralizing influences of semi-idleness, and so satisfied to subsist on potatoes that they had no desire to better this condition.

The value of the live-stock in Ireland in 1841 was

estimated at £21,000,000, in 1857 at £35,368,000, and in 1862 at £32,204,000. The value decreased as much in the three years ending 1862 as was gained in the six previous years; the actual decline arising from the bad seasons, and the pressure upon the agricultural community in consequence. The losses of farmers in the three years ending 1862 are set down by Dr. Hancock at £26,000,000—two years' rental. These losses, though affecting indirectly all classes, have mainly produced pressure on the farmers, entitling them to a large amount of sympathy and consideration. The labouring classes, owing to the rise in wages, increase of employment, and abundance of foreign wheat and Indian corn at a lower price, are suffering much less than was commonly anticipated.

The continued extension of railways is one of the subjects on which the agricultural community of Ireland should be heartily congratulated. They are progressing, and will progress to a marvellously beneficial result to the localities about to be opened, and to the furtherance of national prosperity. The recent Acts of Parliament for providing drainage of land, and other national improvements contemplated by land companies, are likely to give increased impulse to agriculture; hence progress may be hopefully anticipated, and favourable seasons may soon enable the farmers to recover from their recent losses.

PARTLET AND CHANTICLEER.

Every ordinary market has its market ordinary; but our chairman at the "Goose and Gridiron," being a member of the R.A.S.E., and looked upon as a scientific farmer, will have our after-dinner loquacity take the form almost of a Farmers' Club debate. Friday, March 25th, when the cod and oyster sauce, the calf's head, turkey, and two couples of fowls had "gone the way of all flesh"—when the "glasses" had been handed round, and the pipes lighted up—when we had passed comments upon the highest-priced sample of the day, talked over the wonderful dearth of "useful lamb-hoggs," and had a lengthy chatter about Joe B.—his best dog being beat at the last coursing-match—then, at last, the conversation took a regular armyard turn. "Mr. K.," says the chairman, "replenishing his long clay out of a curious bright brass box—a sort of cross between a cash-box and a conjuring trick, opening the lid of its tobacco compartment only in obedience to the call of a coin, 'a halfpenny pay before you'll'—" "Mr. K., how many hens do you keep?" "Whereat Mr. K. (with all eyes turned upon him, most of them dimly leering through the fragrant smoke with an expression signifying that he must be an "old woman" to have any concern with his wife's poultry) replies, "Dang'd if I now; if they was hosses, now, they might be of some ally." And this old farmer, a known breeder of fine arthorses, and a grower of splendid crops, is obliged to confess that nobody at his farm can say within five how many hens bring off one or two clutches in a year; that the old ones take their chance, and die off if they cannot be any longer, while some of the feathered matrons have seen old standards ever since he took the place, ten years ago. Gradually the fact was elicited that, out of twenty-three substantial husbandmen there present, only six had poultry-houses regularly fitted and set apart for laying and roosting. But each man declared that he did (or at least a "missis," or his mother, or his sister did, as the case might be) "keep" fowls; the disparity being great, however, between different experiences, from harbouring that kind of live stock. One tidy-looking young gentleman asserted that fowls cost much more than they were worth,

the lady of the house liking them all very well because she pockets the little proceeds at her lord's expense, while certainly the creatures are most destructive in the garden (I can tell you privately, Mr. Editor, that this spruce young farmer spends half his days in rearing nosebags for his Sunday button-hole, and I fancy would faint if he were to catch his sweatheart ramming barleymeal paste down the throat of an unhungry turkey.) The chairman declared that his poultry last year paid the butcher's bill; the expense of feeding, etc., he could not estimate, but the stuff actually purchased had been very trifling indeed. Mr. W.—here observed that his missus had lately sold at 3s. 6d. a-piece a score of chickens that were hatched (as he expressed it) "in the fore part of the back end." Another staid and respectable cultivator was "aware" of a farmer whose wife had taken £25 for eggs alone within four months. She had several scores of hens, fed them well with corn, meal, potatoes, even meat, to make them lay, and never let them sit. The chairman considered that, while egg-producing was best in some cases, yet rearing and fattening birds for the table was also profitable. A hen brings off two broods in a year, and an average of eight chickens each brood is by no means a high one under fair management; sixteen hens thus produce two hundred and fifty-six chickens in a year, and these at 2s. a-piece come to £25.

When my turn came to talk I maintained that we were all very much in the dark as to the expenses and profits of partlet and chanticleer. Certainly, good managers find their poultry-keeping a very advantageous business, apart from the factitious markets found at public shows; and the experience of thousands of diligent and thrifty wives of "little farmers" (generally men, by the bye, who take a tremendous cut of cloth to make them a greatcoat) ought not to be lost sight of by the fine-lady farmer's wife, who may affect to "take a great deal of interest in the business" (though she soon becomes pert against "talking turnips" whenever a homely "practical" man brings farm topics to her table.) Some people complain of the uselessness of their fowls, they don't make anything by them. Not

likely, when you leave the poor birds to roost where they can, in some cold hovel open to the north, and swept through and through by every cutting wind, whereas the fowl requires warmth above everything. Not likely, when you feed them, if at all, only now and then, when the cook or the groom chooses to throw down a heap of hard dry weed seeds, and grains without flour, called "chicken-corn." Not likely, when you never proportion the number of cocks to the number of hens—say one cock to six or eight hens; when you never draft the aged (say five-year-old) hens, and save young pullets for brood-stock, on the same principle upon which you manage your flock. Not likely, when you let the same old cocks breed in-and-in, without change or selection, till your fowls are dwindled and unhealthy, so that half the miserable chicks gape and mope and die when scarcely fledged. Not likely, when you don't wring the necks of all that lot of coloured and speckled mongrels—some with "topplings," some without; some with "nose" combs, some with "blade" combs; some with four claws, some with five claws on each foot—and then start with a good pedigree sort, all size, constitution, and uniformity of plumage. Not likely, when you never suit your breed to your market—when you keep Dorkings for eggs only, instead of Spanish, or Cochins for the table instead of game and Dorkings. Excuse me, gentlemen; I began to grow eloquent, and only just discovered that I was being guilty of a harangue, by a clatter of applause upon the mahogany, which made the tumblers dance and the spoons jingle.

I happened to order my gig just at the instant when young William S— (who always supports the chair on the left) was starting home, and I found that he had got a fine Dorking cockerel in his dog-cart. Not a word had he added to our poultry confab, but had nevertheless quietly picked up, in that day's market, about as fine a bird as I have lately seen, with small head, wonderfully developed upright comb like half of a circular saw, a taper neck, breast and shoulders broad, girthing almost like an ox, rare legs and claws, black breast-feathers, a creamy golden set of flowing hackles and saddle-feathers, and a tail with bronze-black sickle feathers, and not a white

plume budding amongst them. This bird cost half-a-sovereign: cheap as dirt, I should say; and the new style, size, and stamina, which he will confer upon Mr. S—'s barn-door fowls, must pay him over and over again in the very first year. But I think a farmer ought to take some pride in his feathered stock; he will find it to the advantage of his purse (or else my experience is good for very little), to present his loving spouse every now and then with a handsome, stalwart bird (not necessarily a five or ten-guinea prize specimen, unless breeding for the great shows is to be entered upon); for, as the success of the two-legged herd depends upon the attention paid by the housewife, assuredly this attention will be more dutiful if more loving, and more loving when the objects of its solicitude are highly admired and delighted in. Let the lady of the house hear visitors remarking upon her peculiar charge: "What beautiful fowls you have got, indeed; Mrs. So-and-So's are all very well; but, oh! dear!" and the mistress, taking pride and great interest in her poultry, won't plague her lord and master so much for five-pound bills, or suffer such items as "two pair best kids, ladies," "muslin-pattern, Alexandra," or even the Sunday's almonds-and-rasins and "real St. Michael's," to be "set down," not to her, but to *Mr. —*.

Mr. Editor, you are aware that I have a breed of splendid game fowls (I am rather afraid that you have seen two of my champions guilty of assault and battery in my yard), and my raven ducks (six ducks and two drakes) are the best in this immediate neighbourhood. My wife says of each brood, hen and duck, that it brings her in about 80s. a-year on an average: all we eat ourselves, of course, going down at market value in her little red-morocco book.

As for geese and turkeys, peacocks, and guinea-fowls, they are less, to our taste, than fowls and ducks. But I have a hundred geese on the grass lands all summer, from geese breeders who give "my master" (the missus) half the quills and feathers, and half the birds at 5s. each. I like this better than keeping brood geese.

EX-WISE-HEAD.

THE PRICE OF TOBACCO.

SIR,—Every one knows that this narcotic leaf is sold in the ordinary forms of snuff and smoking tobacco, at from 4s. to 5s. per pound. In the form of cigars it may get to 16s. per pound, and some special brands, when sold retail, may reach 48s. per pound. Tobacco, from its foreign origin, has got to be better thought of, on account of coming over seas, and with all the mysteries of the various brands and labels, always in neat little mahogany boxes. Now, in the London and North Western Railway Guide Book there is given the trade of the principal towns on their line, and among others that of Liverpool, where the working of a cigar manufactory is given in detail. The making of the cigar boxes, the printing of the Spanish labels, and the branding of the hard names, the carrying, rolling, drying, &c., &c. of the cigars, the everyday employment of hundreds of hands, who have never seen either Spain or her colonies; but it is this that gives a seaborne and foreign character to a neat mahogany box of cigars, and the jargon branded on the lid at Liverpool is essential to the price charged for "foreign cigars"

made in Lancashire. Bundles of tobacco leaves imported into England assume, from impost (tax) and impost~~er~~, such gigantic forms as may well impoverish the luckless wight that has to pay—to wit—"THE PIPER."

To other bad habits, sins, and crimes, there are various allurements and temptations; but in the case of tobacco it is ever from bad example, and goes with the long category of other foul-mouth deeds, such as the calling of names, cursing, swearing, and lying; for I never knew a single instance of any one's being allured to tobacco for its beauty, its smell, or its taste. It is singularly unfortunate for the character of this drug that it is everywhere sold along with intoxicating drinks, and has thus got into very doubtful company, and were some generalissimo of smoking to muster his staff and the rank and file of his corps, what a motly slaving legion would be summoned to the front, with pipe and spittoon, clinging to any form of dirt or misery imaginable, and willing (volunteers) to beg or even to steal the favourite weed, and this from the titled right-honourable down to the degraded right-

nasty (if wrong in heraldry, right in truth) ! such are the companions in smoke. The botanist makes the tobacco plant fall into the rank of poisons, along with hellbore, henbane, hemlock, monkshood, dog-mercury, and deadly-nightshade—companions and associates of evil omen to mankind. No sane man can hold with drunkenness ; yet everyone must drink fluids of some kind or other, from his mother's milk in his infancy and innocence, up to old age, when, like Scott's wounded soldier, he begs for a "cup of blessed water from the spring," to slake his dying thirst. Here then is a plea for drinking, but certainly not a plea for drunkenness, and I name it to show that the smoker is without excuse, for there is no natural craving for the clay pipe. It may not be generally known that during the process of fermentation in the manufacturing of tobacco the watery juices undergo a strange transformation, and an oil is formed. Now, in the myrtle and orange tribe (*Myrtaceae*) there are reservoirs of oil in the leaves, and when the leaf of a myrtle is bruised the fragrant oil is spilt ; but in the tobacco leaf before fermentation no oil is to be found. In the ordinary "twists" and heavy tobaccos of commerce oil is abundant, and in some cigars it is nearly absent ; hence the difference in weight and in the character, flavour, and smell of the gas or smoke of the cigar from that of the black twists, and of the one being sold by number and the other by weight. Tobacco is a tender annual of the easiest culture : it is neither curious, handsome, nor interesting. Whoever can grow the common petunia, the well-known annual used as a bedding plant in ordinary flower gardening, can have no difficulty in growing tobacco. The use ("virtues") of tobacco seems to be as a poison, and in this way it does its work so well that a moderate dose will destroy insects without much damage to the vegetable upon which they are feeding ; although a strong dose of the fumes of tobacco will destroy the foliage of most vegetables, as many an inexperienced gardener has found out, to his cost. On presenting tobacco smoke to a healthy person, as soon as it is inhaled the system at once rejects it, exactly in the same way that the stomach rejects poisons, and by coughing flings it back. Now, although tobacco smoke may be drawn into the mouth at short intervals, mixed with a large amount of atmospheric air, and although confirmed smokers may breathe an atmosphere thick with the fumes of tobacco, no one must be misled by this to think that this fume is harmless, for I have seen men carried out of a hot-house where they had been employed smoking to kill insects ; and they were just in the same dangerous way as others that I have had to do with in well sinking, where the poisonous gas in both cases had nearly produced death ; and there are, unfortunately, too many examples to prove the fatal consequences of foul air, and a strong dose of tobacco smoke will assuredly kill either man or beast exposed to its influence. But who will believe this ? or who could believe, that the juice of the husk of the white poppy is the poisonous opium of sleepy deadly celebrity, whilst its seeds are so good and wholesome ? It is a lamentable fact, that few will believe the danger in opium, and no one WILL believe that the poppy seed is wholesome and highly nutritious. When either opium or tobacco has once got possession of the man, he is their bondslave and dupe to his dying day. This paper is not written to dissuade smokers from smoking : there is "no discharge in that war ;" their colours are nailed to the mast, and they must be left to die in the harness ; but still, a class of men may be reared with mouths clean, beginning always with the baby in long-clothes. The tobacco-pipe is simply a retort for the destructive distillation of tobacco ; and the mouth of the smoker is only the condenser of this "small still ;" and the oil-gas from the tobacco has to be accounted for in

no other way than as a deadly poison, beautifully administered, warm and in small doses, to the patient. The properties of the tobacco so distilled are not lost ; and their soothing, or, in plain language, their stupefying effects, are apparent enough. The corn-factor's sense of taste, in buying grain for milling, is of the highest importance in his trade. The dealer in tea consults his faculties of taste and smell, and buys or rejects accordingly. The taster of wines, cordials, chemicals, &c., relies upon the character of his palate for a living ; and I need not say that these niceties of discernment by taste and smell are all impaired by tobacco, smoked or snuffed.

The following equivalents will show by comparison, and beyond all dispute, the costly nature of tobacco :

Half-a-pound weight of good ham makes a principal part of a working man's dinner. Now a ham 17lbs. weight (say thirty good dinners) goes to purchase a couple of pounds of tobacco.

Four pounds of butter for one pound of "twist."

Eight quartern loaves, or 32lbs. of the best wheaten bread, for 1lb. of "shag" tobacco.

Sugar, clean and refined, highly nutritious, and one of the greatest luxuries of old and young, is sold at one-eighth part of the price of "Prinos's Mixture," "Irish Blackguard," or "Brown Rappee."

The cloth for a couple of shirts is another equivalent of a pound of the best "Chester-cut tobacco." The same may be said of a sheet or table-cloth, or a hat.

Two pounds of "Lundyfoot" snuff are equal to a pair of shoes.

A small Welsh cow and calf were sold at the Shrewsbury fair for 4lbs. weight of foreign cigars, made in Lancashire ; and the value of this nice little cow, to a labourer's family, would have made the children happy for half-a-year ; and four boxes of cigars were her equivalent.

The workman that buys and burns 1lb. weight of tobacco (of that kind which labourers chew and burn in ordinary) burns by wilful fire-raising 32lbs. of the best wheaten or oaten bread ; and when the equivalent is laid in ashes, it is the same loss. It is lost to that man's family and to his heirs for ever. He has indeed given his money for that which is not bread.

Smoking in railway carriages has a penalty of 40s. attached to it. This, too, comes of tobacco.

In certain factories, instant dismissal is the penalty for smoking ; and in manufacturing towns we see placards—"Beware of juvenile smokers, as they generally turn out to be thieves.

There is a "dainty dish" used by the higher order of smokers, called the meerschaum pipe, which, when coloured by use a nutty brown with the oil, is valued at £5 to £10. The "briar-root" pipe, mounted with silver, and having a goose's leg-bone for the stalk, a glass mouth-piece, and a cushioned case for carrying the same, comes to little less than one pound sterling, and would be considered reckless trading, if parted with for less than five or ten shillings.

I do not stop here to notice the lesser lights connected with smoking, such as the "Garibaldi lights," "Vauvians," and all such trifles, although they all tell fearfully in the aggregate of a whole community, smoking for the term of their natural lives.

The faculties God has given us are beyond all price : witness the blind man's prayer—"Lord, that I may see !" It is hard to see the price of food and raiment paid for a narcotic poison, and a miserable old age endured, as the price paid for tobacco,

A. FORSYTH.

PSEUDO-OPPOSITION TO THE REPEAL OF THE MALT TAX.

That a large number of the agricultural body are subject to gullibility; that not a few county knights in Parliament are unfortunately included therein; that townspeople in general, and certain political journalists in particular, are prone to take their fun at the country, that it forms a very attractive popular part of the old bacchanalian idiosyncrasy, and that it is about to be played off in Punch and Judy style upon farmers and all and sundry who advocate a repeal of the malt tax, is only akin to the old story, "GREAT IS DIANA OF THE EPHESIANS!" We can readily understand the "hue and cry" of those whose "craft is thus supposed to be in danger," and even extend a feeling of sympathy for the poor wretches upon whose devoted heads the iniquities of their guilty ancestors are now being visited, and whose drunken habits and position would be for a time, under beer and tobacco at a reduced price, some degress worse than at present; but while we do so, we must at the same time carefully guard against indirectly subscribing to the injudicious system that is the proximate cause of all this misery and degradation to our labouring classes, viz., the malt tax, beer shop, bacchanalian village system—i.e., public drunkenness as the Government source of public revenue! for this, and a great deal more, has only to be seen in its true light to be practically understood.

All these bacchanalian rouses mean of course so many objections to the repeal of the malt tax, and an increase of the income tax, to which it is presumed that the repeal of the malt tax would give rise, that cannot be otherwise prudently advanced. Such being the nature of the arguments in question, it follows that before tossing them to the winds as tenfold worse than fallacious, because the offshootings of a system out of date, it will be advisable to take a very cursory glance at the true position of things, viz., 1. The practical and scientific foundation upon which the economy of giving malted corn to cattle is based; 2. The propriety of using the home-brewed ale of the farmer and labouring man or the beer-shop mixtures, or even tea and coffee; 3. The increase of incomes and of revenue arising from improved industry and morals in comparison with the present system of drunkenness and debauchery; and, lastly, the objections as "a gallon of ale for fourpence," "waste of nutritive element in the malting of barley," "Scotch experimentalism," &c., &c.

The first of these propositions is a chemical one of a kindred character with the heating of the hay-stack in hay-harvest. With the advantages of properly made meadow hay the English farmer is familiar. True, he may not know the exact chemical data upon which these advantages are based, scientifically speaking; but, practically, he is versant with the advantages themselves, and also with the contrary when his hay is imperfectly made, as when the heating process is imperfectly performed. Agricultural chemists and scientific men, it is true, have advanced various theories to account for this increase of dietetic value that takes place during the heating process, although the actual weight of hay is often considerably reduced; but as yet such theories are unworthy the credence of practical men, so that they can only be taken for what they are worth by the amateur and more gossiping portion of the agricultural public. In a similar manner agricultural chemists and philosophers "have spread their airy wings far and wide;" and thus following each other, have flown to the assistance of the practical farmer with the good intention of informing him, also scientifically, how the malting process increases the dietetic value of barley; but as yet their ratiocinations and conclusions are something worse than mere "cackle," while this same noisy "cackle," so often repeated, is diametrically opposite to the flesh-forming, fat-forming, and other pseudo-rules of the laboratory, by which they solve all dietetic questions alike for man and beast! In short, practice is ahead of science in this department of stock management, so that until scientific discovery beats up in the march of progress, practical farmers must listen to the voice of Experience, which tells them that, like the heating process of the hay-stack, the malting process, somehow or other, improves the dietetic value of their barley.

But this is not all. Malt not only possesses more available nutriment to cattle than the barley from which it was made; but, by judiciously mixing it with other feeding stuffs, it also renders a greater per-centage of their weight available aliment for conversion into beef and mutton, or milk, as the case may be, while the quantity and quality of the animal food thus produced for the support of man are both greatly increased, together with the health of stock, &c.

In the preceding remarks we have confined our observations to the changes that take place under the malting process; but there is every reason to believe that farther changes take place favourable to the use of malt as a condimental feeding stuff, because when properly dried it is superior to the sprouted grain taken directly from the malting floor. Under this head, therefore, further experiments are wanting to test the truth of the matter; but so long as the malt-tax remains in the hands of maltsters exclusively engaged in malting for brewing and distilling purposes, and so long as Parliament and agricultural chemists continue erroneously to assume that chemical change in the two cases is the same, the door to progress is so effectually barred by such, and by excise regulations, that no agriculturist can enter upon an experimental course so as to prosecute practical inquiry in the proper direction. A more unjust and anomalous state of things can hardly be imagined.

The next question is the use of wholesome home-brewed ale by our labouring classes as an element of diet in their own houses in opposition to the use of intoxicating beer and tobacco in public-houses, and also in too many private ones. It cannot be denied that by far the greatest portion of the beer and porter now drunk, from which the present malt-tax is derived, is in this latter objectionable inebriating sense; consequently, the greater the amount of revenue derived from the malt-tax the greater the curse and general loss to the nation! This must be considered a political axiom that requires no proof to substantiate its general truth. If, therefore, this objectionable feature of the present system of deriving a revenue from drunkenness and tobacco-smoking could be done away with, and our working classes induced to brew their own ale and drink it at home, or use brewers' pure malt ale from their cask, as an element of diet, it is manifest that a very great national gain would be effected; but the malt-tax and the excise laws and regulations effectually prevent any prospects of such a change. In point of fact, they have produced the contrary effect. It is, no doubt, a very nice theory to talk of the subdivision of labour into regular maltsters, brewers, and publicans, and the increase of trade to which such has given rise in a manufacturing and commercial country like this; but when closely examined in all its bearings, it is the veriest fabric of a vision that can be imagined, being devoid of those principles upon which free trade and subdivided labour can be securely based. The farmer and labourer, for example, take their daily allowance of beer at diet-time along with their meat, pudding, bread and cheese; if therefore it is sound political economy to tax one element of the labouring man's dietary, in order to find trade to a second and third party, it is also sound policy to tax the others! If it is right to tax the malt from which the beer is made, it is equally just to tax the four quarters of the ox and carcass of the sheep from which the steak, chop, or small joint has been cut, in order to send custom to the chop-house? Also to tax the wheat from which the loaf of bread is made, and the cottage garden, for the sake of the public baker and greengrocer? and the milk from which the cheese and butter are produced, for the advantage of town dairymen, &c.? But this the Legislature does not do, for a very good reason—because it would not be tolerated by the public for twenty-four hours. But why make one element of the poor's man's diet an exception to the common rules as regards all the other products of the British soil used as the daily necessities of life? Is it possible to justify this, together with changes to which it has given rise—changes which have been productive of so much drunkenness, demoralization, and poverty? or, to uphold them against a return to the old and sounder policy of home-brewed ale

from malt, only used by the labouring classes as an element of diet in their own houses? With regard to the argument of the regular malster, brewer, and publican, as distinct branches of subdivided labour, it would just be as sound political and domestic economy to talk of sending the mistress's tea-pot and frying pan to the dogs for the sake of establishing in the village close by two new branches of industry? for the provinces are sick enough of pseudo-mongering of this kind already, there being hardly a young woman to be found in the village or country town who knows how to cook her intended's dinner! while there is scarcely one in a thousand who can brew him a glass of good wholesome malt ale! Such is the retrograde direction in which our cottage economy has recently been driven by our malt-muzzled knights of St. Stephen's!

With regard to the increase of income that would be derived from a more industrial organisation of society, and the counter proposition of loss arising from the present beer-shop system, it is not very easy to deduce from the facts of the case even a distant approximate estimate. Suffice it to say that any change from the present obnoxious beer and tobacco system as practised in the vast majority of beer shops, or even from the family cask direct from the large brewery, must be, according to the nature of things, one of degrees. We, for example, could quote individual cases where the increase of income of a working man exceeded £10 yearly, while his expenditure for beer has been reduced to a greater amount. The amount of wages which some hands annually spend in beer and tobacco is incredible; and the loss which they and their families thus sustain is often many degrees less than that experienced by their employers. Now, as both these losses have to be borne by the public, what is the general conclusion? The county member in parliament who cannot see this must be blind in both eyes. To those who cannot comprehend that well-ordered labour is the true source of all wealth, and that all taxes are paid directly or indirectly out of the profits arising from such labour, it may not be so easy to furnish proof that the annual loss sustained from our present drug-brewing and beer-drinking system exceeds the malt-tax many times over. But be this as it may, it follows that, according to the old proverb, "a penny saved is two pence gained," if £12,000,000 annually could be added to the profit side of the balance sheet by a gradual return to home-brewed pure malt-ale of the olden time, with sober and industrious habits the public could well afford to give up the £8,000,000 revenue from the malt-tax also by degrees, and be net £6,000,000 the gainer. To the agricultural body, for its own exclusive use, the malt tax may at once be given up without any fear of injuriously affecting the public revenue. The days of smuggling or turning the tea-kettle into distilling apparatus are long gone by. We do not know a single farmer or landowner between the Land's End and John o' Groat's who would allow characters of this class to live upon their farms or estates. That such wretches may be found in villages and towns is more than probable, but only so long as a system of taxation exists which holds out any prospects of profit. Otherwise the reverse is true; for repeal the malt tax, and they would be in a worse position to carry on an illicit traffic of this kind than they are at present. We therefore repeat that the repeal of the malt tax would reduce the facilities for illicit distillation and smuggling amongst the lowest of the low, in towns and villages. It would also reduce the premium now held out to brewers and publicans to use foreign intoxicating substances; consequently it would encourage the brewing of more wholesome ale from pure malt for family use, and the taking in of small casks of ale direct from the brewery where families had not the means of brewing at home, and thus obviate one great evil, viz., the sending of the work-people's children to the beer shop, and the taking in of the drugged stuff at the door by servant girls, &c.

The transition to which we have thus briefly drawn attention is based upon sound principles, and will bear a practical investigation. Farther into its details our limits will not permit us to enter at present, but enough has been said to give its general outline and to furnish data for tossing the objections, forming the last head of our subject, to the winds.

The first objection is, that a repeal of the malt-tax would reduce the price of ale, and this would increase drunkenness. Drunken sets, for example, are to be found who will about

at the ensuing election, "fourpence a gallon ale," and in anticipation of this pseudo-opposition to the repeal of the malt-tax, this same fourpenny-gallon-ale advocacy, the slang phrase thus quoted, is already being put forth in the leading columns of the *Times*. The political rouse is manifestly the sowing of the seeds of gullibility in the minds of malt-muzzled county knights, and the few silly farmers who will catch such bait.

Practically stated, the two sides of the question stand thus: The consumption of malt by cattle would keep up the price of barley nearly half the malt-tax above its present level. Afford the better-disposed portion of the labouring classes the means of using wholesome malt ale regularly in their own houses as an element of diet, and they would cease going to the public-houses and joining in those occasional outbursts of drinking that so embitter domestic happiness at present. This eventually would clear the public-houses of drunkenness and tobacco-smoke, with which they stink so odiously as present. Now, such changes would naturally produce the contrary of "fourpenny a gallon ale;" and this is what our great brewers and their retail depôts know right well; for if none but the lowest dregs of society were to visit them, it would be an evident token to prepare for closed doors and empty tills in the long run. On the other hand, granting that the repeal of the malt-tax would not produce the above effect, and that town's people and villagers would continue to throng beer-shops as at present, it is nevertheless questionable if the retail price could be reduced one farthing, more especially if barley maintained its present maximum price. Certain it is that the retail price over the counter do not at present fluctuate with the price of barley and malt. The only practical difference, then, that is likely to be experienced, would be the retail of a more wholesome article, in order not to lose business. And with regard to the statutory maxim of "taxing drunkenness," for the twofold purpose of revenue and cultivating temperance, it has proved itself to be the old story of "serving God and Mammon!" or the very reverse of what it purports to be. In other words, the devil has outdone both the Legislature and the Chancellor of the Exchequer!

It requires no lengthened argument to show that the former of these conclusions is the true one, and the only one too that can be safely recommended to the reader's serious attention. Tea and coffee (as substitutes for beer and porter) have had a strong advocacy for some time past; but were people's stomachs allowed a voice in the matter, to say nothing of the nervous system in nine cases out of ten, their relaxed and injured state, from these beverages being drunk too hot, would turn the tables entirely round about. The stomach of a hard working man is different in many respects from that of the idler, or those engaged in literary and similar pursuits. And besides, our labouring classes have not always boiling water at their command; and cold tea and coffee caged about in a tin flask are, in nine cases out of ten, the reverse of what the system of the hard-working man requires, more especially those labourers the solid portion of whose food consists mainly of wheaten bread, bacon and cheese, with occasionally the inferior parts of obese carcasses of oilcake-fed cattle and sheep. Narcotic alkaloids have been declared, on good authority, incompatible with living nerve and muscle, and their healthy reparation, for they belong to the cholera morbus, &c., generating productions; while, on the other hand, a glass of good home-brewed ale has, from time immemorial been acknowledged at the bar of experience to possess a fraternal relation with roast beef, cheese, and the other elements, of which the nerves and muscles of the labouring man are preserved in good working order. Hence the conclusion.

With regard to the waste of the so-called fat-forming elements of barley during the process of malting, the objection has already been indirectly answered. Malt, for example, has been shown to be a condimental species of food that renders more of the ordinary food available, and this is applicable to the formation of healthy fat as well as to the formation of the lean portion of the meat. The very same objection is as applicable to the hay-stack, whose contents are largely wasted in the heating process and the chemical changes which thereby take place, as to the malting of barley and the changes which thereby take place; but in the one case, as in the other, the new products formed possess more available nutriment than even the hay and barley given to cattle prior to their having undergone the heating and malting processes. Hence again the conclusion.

And with regard to the Edinburgh and Glasgow experiments so often ignorantly quoted, they only prove how imperfectly the subject is yet generally understood, and that the experimentalists were in these cases unqualified to conduct the inquiry in question as to the economy of feeding material, for the trials were made in the most objectionable, and even as a question

of experimental inquiry, absurd manner imaginable. It has already been shown that the experiments are yet wanting to test the economy of malt as a condimental feeding material, so that it would be superfluous farther to expose the ridiculous character of the Scotch experiments, by going into their details.

FARM WORK.

No. III.

INANIMATE POWER, ITS VALUE AND ECONOMY.

The prime movers in the service of the farmer to which attention has to be directed in this paper are steam, wind, and water. Of the three the first now occupies the more prominent position, owing to its being applied to the working of implements in the cultivation of land. Little requires to be said about windmills, as they are rather getting out of fashion. With water it is otherwise, where a proper supply can be had, provided it does not interfere with drainage and other resources of wealth.

The steam engine may be examined under the following three heads: *first*, the quality of the materials of which it is constructed; *second*, its mechanical construction and effective power when at work; and *third*, the expense of working it.

That the steam-engine should be constructed of the very best materials at command is a proposition that will readily be granted; while, at the same time, two collateral ones must also be admitted, viz. (1) that considerable progress has recently been made in metallurgy, and (2) that this branch of our native manufacture is still subject to further improvement.

The grand object is to get the greatest amount of strength, and the least amount of tear and wear, from the several parts. Such being the problem, it follows that the quality best adapted for one purpose may not be the most valuable for another. Thus, between the boiler-plate acted upon by the water and steam, and the furnace acted upon by fire, there is a wide difference of mechanical function; also between the crank-shaft, connecting-rod, &c., and the bearings in which they work. Reduced to its simplest form, the question may thus be practically put for solution, What is the best quality of material for each separate part of the steam-engine?

It would be an easy matter to give a general answer to this interrogatory by saying cast-iron for this part, malleable for that, steel for the next, brass for the fourth, and so on. But, after we have got this length, we only cross the threshold of our subject to enter upon its practical solution; for, in each case, there is a wide diversity of quality, while new metals and compounds may be discovered superior to any now in use. Thus, considerable progress has recently been made in this direction, and further advances may therefore be reasonably expected for the future. No doubt along with this movement the desire to produce a cheap article has a tendency to produce the opposite, viz., an inferior quality of metal; but this set-off is not applicable to steam-engines, or at least should not be so, for they, as already granted, should only be made of materials of the first class.

The best quality of metal for the boiler and some of the other working parts is, perhaps, the chief question of the present day. It is only just now that these and other more severely strained parts of portable engines are found to be worn-out from fair tear-and-wear; consequently, only a limited amount of experience can as yet be brought to bear upon the investigation of the case. Reasoning from analogy, or from parallel examples, is always attended with a certain amount of liability to error, and perhaps the examination of steam engines in the service of farmers is in a superlative degree subject to this objection. But, be this as it may, agricultural engines, both fixed and portable, are liable to, perhaps, a greater amount of tear-and-wear when idle than when they are in use, and this peculiarity in their industrial function requires special attention in the choice of material for their construction. In other words, it may be possible to make boilers that will stand uniform continuous use, which would corrode and otherwise give way under the alternate system of

idleness and action. When a farmer, for example, only employs his engine at thrashing, it is many more days idle than at work. When he houses it for a holiday of a week, a month, or even three months in the summer time, he may use every precaution in his power to avoid corroding and consequent harm; but when he has done his best, it is no exception to the common rule due to fallen humanity, for every time the engine is turned out to thresh or plough after being for some time idle, some part or other will be found to have suffered from the excessive wasting hand of Time, and from such the other parts are also liable to experience less or more harm; consequently, putting the whole together, the conclusion is manifestly against idleness, and in favour of regular uniform work. Even in the processes of stopping and starting, the working parts often sustain more injury than when kept going, which may be readily accounted for by any tyro in mechanics. In short, the different parts are each subject to several kinds of tear-and-wear. Thus, the boiler-plate is subject to the corroding action of the water and salts which it may contain, to incrustation and burning, and to the immense pressure of the steam, which at times is much higher than necessary. The other working parts are subject to wearing at the bearings, to twisting less or more longitudinally or laterally, to rusting, and, at the starting, to sustain harm from extra strains of steam, and, at stopping, from the momentum of central force.

In the construction of engines various improvements continue to be made, and doubtless the future will acknowledge a similar line of progress. Of late, steam culture has given rise to many additions, and it may not inaptly be said that a plentiful brood of fresh ideas are at present in embryo. At the same time, the fact must not be overlooked that we have attained to a very high degree of success in the manufacture of both fixed and portable steam engines for farm work.

Whatever, then, may be said to the contrary, the application of steam to the cultivation of land has evidently commenced a new era in the history of the steam-horse. They are at the present time, doubtless, not a few practical agriculturists who are far from being satisfied with the amount of success attained in his symmetry and dynamical performance. They accept the whole affair of steam culture as a promising link in the chain of progress, but nothing more, being confident that the construction of engines, hauling-tackle, and implements now in use will at no very distant date be superseded. The reader is not hastily to conclude from this that they are against present systems. The very reverse of this is their motto and line of action. In other words, they argue that it is their bounden duty to support the present system, as a stepping-stone to a better. Indeed, they would not be intelligent, practical men if they acted otherwise.

The conclusion, therefore, is in favour of the present engine, generally speaking, and upon the whole highly satisfactory in a practical sense. In the stackyard they have proved themselves a complete success at thrashing all kinds of crops under every mode of harvesting that is practised in the kingdom. Whether the corn is cut with the reaping-machine, the scythe, the bagging-hook, or the old sickle, bound up into sheaves, or stacked loose like hay, they make, under proper management, good work and plenty of it; the straw being either delivered upon the mow, or cut into chaff and carried to the bin ready for the most economical use, and the corn delivered ready for the market. In some individual cases, the untied sheaves are fed at the one end of the mechanical system, when the wheat and the straw come out at the other; the former not only

ground into flour, but manufactured into bread ready for the use of the farmer and his customer; and the latter cut into chaff, being thus ready for the use of the cattle. Under any consideration, such must be acknowledged no ordinary triumphs in the March of Progress. And if such has been our mechanical success in the stackyard and threshing-bars, the future prospects of steam in the field, in the cultivation of land may safely and reasonably be left in the hands of the same Triumphant Body of Engineers.

Into the mechanical details of construction it is, of course, not our present province to enter, our proposition being limited to the industrial view of the subject, viz., the successful performance of work, and thus far the symmetry and mettle of the steam-horse are conclusive as to his present success, both in actuating threshing machines and tillage implements. And as to the future, such should always be left an open question for farther progress; and accordingly we leave it in the hands of its own destiny, if we may so speak, as suggested in the concluding sentence of the last paragraph. Machinery is now being largely manufactured by machinery, and under such there is always a tendency in systems of mechanical organisation to become antiquated, and thus to retard the wheel of progress. Consequently such systems of mechanism are liable to be superseded by others constructed for turning out more improved designs of construction. At the present time, therefore, when steam has commenced its triumphant career in the field in the cultivation of land, it is the interest and the duty of the owners of such constructive machinery, when it is worn out or nearly so, to look-a-head before they make a renewal on the old plan; and we may further observe, that those employed in designing and making new systems of constructive machinery of this kind, for the manufacture of steam engines, hauling tackle, and implements of tillage, are indirectly engaged at farm work, and are, if successful, doing more to advance the cause of British agriculture, than the farmer and ploughman, who are directly at work in the field with their antiquated or less perfect tools.

We next come to the question of expense. This is always the first topic discussed amongst practical men, although we have made it the last. It includes not only the prime cost of the steam-engine and machinery actuated thereby, but also the economy of fuel and steam, together with management, repairs, and the durability or lifetime of the steam-horse. In these several respects there is a close similarity between horse-power and steam-power in agriculture; for, as has already been shown in a former paper, it costs no little money to start the former in harness: so in like manner it requires a large sum to bring the latter into the field; and in both cases the principal outlay of capital represents labour or farm-work indirectly performed. Again, as the horse team requires proper food, grooming, and management, so the engine consumes fuel and steam; besides which, it requires no little repairs and attendance to keep it in active operation. Now in both cases

the outgoings of the farmer represent the cost of manual labour, as in the preceding two examples. To overlook this fact is virtually to deny the existence of the back-bone of British agriculture in modern times, for the farmer who thus successfully uses steam actually employs more hands off the farm than on it, and the former at much higher wages than the latter, while the implement makers and their artisans give employment to other branches of manufacture and commerce.

Under each of the heads of this question progress is being made. If the nominal price of the engine is not much less, its durability and effective usefulness are greatly increased, which latter are of greater value to the farmer than the former. A very great economy of fuel and steam has also been effected in comparison with former times. Steam-culture will enable farmers to take their money out of their steam-engines in less time by their being more continuously at work, and by so doing they will effect a very considerable economy in the management, repairs, durability, or total amount of work performed by the engine during the period of its existence. From this it follows that those who have portable steam-engines, and do not employ them in steam-culture, stand greatly in their own light. With the details of these several heads of our subject the readers of the *Mark-Lane Express* must be practically familiar, and therefore it would be superfluous in this paper to dilate upon them.

Windmills are principally used for grinding in comparatively level champagne districts, where waterfalls cannot be had. They are interesting mementoes of the past, and in many instances perform a large amount of work at no great outlay of capital, or expense in the management.

Where there is a proper supply of water, it has many things to recommend it as a motive power for thrashing. In mountainous districts, as the North of England and most parts of Scotland, there are very few farms of any extent which have not their "water-wheels," "mill-dams," &c. In not a few cases the drainage water of the farm is collected and made to thrash out the crop, and do the chaff-cutting, with similar minor jobs, as the grading and bruising of corn for cattle, the sawing of paling for fences, or the cross-cutting of wood for firing.

In the examples of wind and water power much progress of late years cannot be reported. In a number of cases both have been supplemented by steam, and now that the latter is being successfully applied to the tillage of land, the balance in its favour will be greatly increased. In the milling trade there will be less in its favour, for in those cases where the gathering of water in the mill of the farmer is done away with, it will in not a few instances find its way into that of the miller, and thus increase the effective work of his millstones in grinding. In the thrashing of corn crops, however, it may safely be said that the water-wheel will doubtless continue to perform its functions so long as water flows.

THE PRICE OF WHEAT IN FRANCE.

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE."]

MY DEAR COLLEAGUE,—I have not forgotten the kind challenge addressed to me by M. de Praingy through the medium of your journal, and have only waited till the commercial statistics of the year could be collected before I replied to it. You will remember M. de Praingy complains of the low price of corn since last harvest, and appears to attribute it to the abolition of the sliding scale. Now, I do not deny that corn fell in the second half of 1863 to a very sorry figure for many of the producers; but is "free trade" to blame for this lamentable fact? That is the question we ought to ascertain.

We shall begin by giving a correct account of the importation and exportation in 1863, taken from statistics published by the custom-house authorities. The importation of cereals altogether amounted to 71 million francs, 50 millions of which were for wheat in grain, 6,800,000 francs for flour, the same amount for rice, and the rest in maize, rye, barley, and oats. The exportation only amounts to 63 millions, of which

13,500,000 francs were for wheat in grain, 4,800,000 francs for flour, 13,700,000 francs for rye, 21 millions for barley, and the rest for other grain. There is therefore an excess of 9 millions of importations; but this difference disappears when we take into account other farinaceous aliments, such as potatoes, and dry leguminous food. The importation of these two articles only reaches 4,400,000 francs, whilst the exportation is increased to 15 millions, to which we may add bread, biscuits, chestnuts, groats, fensils, &c., the export of these being more than 3 million francs.

Upon the whole, the importation and exportation of farinaceous food is pretty equal; indeed, there is even an excess of 4 or 5 millions in favour of the latter. I do not pretend to say that this result is all we have a right to hope for from free trade; it is, in fact, but just born, an instrument of which we do not yet know the use. Besides, circumstances were particularly unfavourable in 1863. An abundant harvest throughout the north of Europe deprived us of a part of

our markets; at the same time, a comparatively middling crop in the south kept up the price in our south-east region to a height which permitted importation. Circumstances such as these do not usually occur.

What I maintain is, that in any and every case the situation would have been no better under the system of the sliding scale. The importation and exportation being balanced, the action upon prices must be null. We sold rye, barley, potatoes, buckwheat, &c., to buy wheat: there the consumers gained without the producers having lost; and this is one of the unexpected effects of free trade. How would it be if we were to speak of other agricultural commodities? The exportation of wines and brandy exceeded 3 millions, that of eggs 23 millions, butter 30 millions, &c. The importation of wool amounted to 240 millions; but it has been more than covered by the exportation of wool and woollen cloths, which amounted to 325 millions of francs.

Definitively, the price of corn has not fallen so low in 1863 as in several years which preceded the abolition of the sliding scale. I find the average price was 20*fr.* per hectolitre—21*fr.* the first half year, and 19*fr.* the second; whilst in 1858 and 1859 the average of the year was 16*fr.* 75*cs.*; in 1850 and 1851 it was 14*fr.* 50*cs.*

I know well that M. de Praingy refers less to the importations of 1863 than to those of 1861. "The enormous introduction of that year," said he, "had the effect of reducing the price in the interior too much, and the producer did not gain from the advance, compensation for what he lost by the bad harvest." I have several replies to make to this.

In the first place, I do not deny that there was a little too much imported in 1861; I have already had occasion to say before the Central Agricultural Society that we proceeded on that occasion with our usual impetuosity, and that commerce has had to repent of it. Let us hope the lesson has been profitable. On that subject I ought to thank M. de Praingy for having reminded me that I proposed a fixed duty of 1*fr.* on entry. What has taken place the last three years confirms me more and more in my opinion. This duty would help to diminish importation without imposing an appreciable charge to the consumer, and to increase by several millions the receipts of the Treasury.

Secondly, it ought not to be forgotten that the importation of 1861 would have been the same in any case; for government would not have failed to suspend the sliding scale, and the most absolute liberty of introduction would consequently have still existed. The duty of 50*cs.* per metrical quintal, established by the new law, would not even have been noticed; and, the outlet not being free, the small current of exportation, which partly compensated for the importation, could not have formed itself.

In the third place, notwithstanding that enormous introduction, the average price of corn in 1861 was sustained at 24*fr.* 50*cs.* the hectolitre, and in 1862 at 23*fr.* 25*cs.* These prices might have been a little higher, though, for my part, I could not see any advantage in it; but beyond 25*fr.* or 26*fr.*, the question of humanity merges into that of benevolence. In certain districts the price has now exceeded 30*fr.* the hectolitre. At this rate suffering becomes very great, mortality increases, births diminish, and the progress of the population is arrested, as we saw in the years 1854, '55, and '56.

M. de Praingy complains more especially of the price of grain in the centre of France, and not without reason. Upon consulting the table published in your last number, I found that wheat sells for less in the centre than anywhere else. Whilst the price current at Nîmes is 28*fr.* 60*cs.* the metrical quintal, at Bourges it is 20*fr.* 50*cs.*, making a difference of 8*fr.* in two places not 500 kilometres distant from one another. These differences, and sometimes greater, canals, railroads, routes of all kinds, sensibly reduce, but there are still too many of them.

What the centre requires more than anything else is, the completion of a railroad from Brioude to Alais, which would open a direct way to the Mediterranean. Corn would then rise at Bourges, and fall at Nîmes, which would have the effect of reducing the importation; for, whilst the south-east could supply itself at home with wheat at a good price, it could have no interest in getting supplies from abroad.

It is not in combinations of taxation, of which experience has shown the emptiness, that agriculturists must in future look for better prices for their produce, but in commercial

activity at home, the reduction of tariffs, railways, and other means of transport. All efforts made in that way will be efficacious, and all other means will prove a failure. More extensive means of communication will not only tend to level prices, but, by opening markets to all products, without exception, will improve the circumstances of the people, accelerate the progress of the population, and thus doubly increase the mass of consumers, and, consequently, the demand for agricultural products.

M. de Praingy places, on the side of the price of corn in the Centre, the advance of wages, and asks if the equilibrium is not destroyed between these two elements? That is a question altogether distinct, and has no connection with the first. There are two reasons for the advance in wages: one is, the natural and legitimate consequence of the progress of riches; and that should not only be accepted, but rejoiced in: the other is the artificial and compulsory consequence of an excessive military state, and of the immense concentration of public expenses, that agriculture would do well to fight against with all its force. But I can merely refer to these questions here, as they do not enter into the compass of a "*Journal d'Agriculture Pratique*." I have stated my opinion on this subject in my "*Economie Rurale de la France depuis 1789*," and in my book entitled "*L'Agriculture et la Population*."

Respecting the question of customs, I beg permission to remind you that, when we raised the flag of free trade, we did not say we could remove all difficulties thereby. We confined ourselves to stating that agriculture allows itself to be deceived by a false protection, and that liberty of commerce, frankly accepted, would be better for it. We did not pretend to say that prices would always be sustained at will, or that alternations of good and bad crops could be charmed away. We merely said that importation and exportation would have ruled themselves better than an obscure and deceitful legislation, which was suspended in difficult times. The facts are satisfactory, in spite of some unfavourable circumstances either in 1861 or 1863; and, again, the experiment is but commenced.

After all, if the exportation in 1863 did not reach the same level as in 1859, it is because prices were sustained at a higher rate at home, and if England failed us at least: for wheat—for it was she that bought the greater part of our barley and potatoes—we kept our markets in Belgium, Switzerland, and Germany.

On the other hand, Southern Russia, which was to have inundated us at all times with its products, sent us only 507,000 metrical quintals in 1863. I am well aware that even this is too much, and if the communications between Marseilles and the interior had been more perfect, the quantity would no doubt have been reduced, but after all it is not what they announced to us; there was not even sufficient to supply the city of Marseilles alone. Algeria, too, that other bugbear, only sent us 172,000 metrical quintals. But we have under our eyes another and more striking example; amongst the countries which it was said were to swamp us with their cereals was mentioned Hungary; and the fact is, during the last scarcity, we did not receive from thence any large quantities of grain. But last year a drought scourged the whole of Hungary so cruelly that almost the entire harvest was lost, and they were obliged to feed the population with foreign grain, in spite of the impetus which the opening of new markets had given to culture. Hungary was not only unable to supply us, but, had the commercial relations been sufficiently established, we should in our turn have had to supply them. Let us then with confidence leave the consequences of free trade to unfold themselves, and accept it not as an enemy, but as an auxiliary, and in no case let us attribute to that what does not belong to it. It cannot cure all evils, neither does it create them.

I hope that my explanation will be satisfactory to M. de Praingy; he is one of those men whom I most wish to convince, for he expressed his doubts with as much frankness as courtesy. With regard to the principal subject of his letter, the *métayage*, I am entirely of his opinion. I have several times had occasion to speak of the lease à *métairie*, and have always expressed the same opinion. A proprietor myself in a country of *métayers*, I believe that the best way is to conform to the local customs, which have reasons for their existence, and that in every rural transformation we should bring in the times as a necessary ele-

ment. The *métayage* has besides, this advantage, that it is ready for all combinations; it contains the most fruitful of all principles—association, and in the hands of active and intelligent proprietors, facilitates rather than hinders the progress of agriculture. I have especially praised the present state of the *métayage* in the West, as well as M. Rieffel, who mentioned it in the preface of his excellent work called

Manuel du propriétaire de métairies; but I am convinced that in the east of France it is also an instrument of improvement, and that where it does not prosper it is the fault of circumstances, not of the system.

LEONCE DE LAVERGNE,
Member of the Institute, and of the Imperial
and Central Agricultural Society of France.

THE ROYAL DUBLIN SOCIETY.—THE SPRING SHOW.

The Spring Show of the Royal Dublin Society was held the last week in March, commencing with the award of the prizes on Tuesday morning, and terminating on Friday evening. As a whole, the show was very satisfactory, there being 323 entries in the cattle sections, besides a fair gathering of sheep, swine, poultry, and implements. The entry of draught horses, however, was very deficient, which cannot be attributed to the attractions of the National Horse Show, arranged to come off in a fortnight hence, under the auspices of the Royal Agricultural Society of Ireland, as farm horses are not included in the premium sheet which has been issued for that occasion.

The judges who acted in the Shorthorn class at Dublin were Messrs. Unthank, Stratton, and Drury, and every one was loud in their praises of the painstaking manner in which those gentlemen did their duty. The yearling bulls showed mostly a want of condition; but this was nothing the worse for those who bought them. The sale of young bulls is, in fact, a leading feature in the Dublin spring shows, all who require such usually waiting until the meeting, and for this reason there are always a considerable number brought forward, whose owners could never hope to get a prize, their principal object being to sell. The shows are therefore of great utility, and have served more than anything else to secure the distribution of well-bred animals through the country.

The first prize yearling bull of the show came from Mr. Crosbie's herd, just as the first prize yearlings of the previous two years had done, this position being due to the use of Lamp of Lothian, who was the sire of the first prize yearlings of '62 and '63, and the grandsire of the prize yearling of this season. Although the cup and section first prizes go again to Mr. Crosbie, these have not been taken by the bull he meant should win, and which had been specially prepared for the purpose, while the actual victor had been allowed to take his chance, in a great measure, with the other calves. The one his owner "declared with" was, however, entirely passed over by the judges, without even the honour of a commendation. The winning bull is neat and nice, and, if well taken care of, will be a good one. The second prize yearling belonged to Mr. Wallis, of Co. Cork, and is a good handling dark roan, of Soubadar's get. The third prize in the yearling section was awarded to another Soubadar calf, belonging to Mr. Meade, also of Co. Cork, and one that promises to be a bull of great substance, as well as of good quality. The fourth prize was awarded to Col. Lealie's Confederate, one of the calves left by Dr. McHale, during his sojourn at Glasslough, in Co. Monaghan. Confederate is a bull of great constitution and fine quality, and very good in the loin and back. The commendations in the section were awarded to Mr. Borton's Duke of Straffan, Mr. Low's Star of the West out of Ambler's Cactus, Mr. Jones's Champion, bred by Mr. James Anderson, and Master Fairfax of Sittyton blood, and Mr. Lyon's Drummer.

The two-year-old bulls were better than usual as a class, some of the animals shown being very superior. The first prize, and also the Irish Railway Challenge Cup, given for the best bull two years old and under five, were

awarded to Mr. Barnes's Dr. McHale the Second, which was got by the celebrated Dr. McHale, of which Mr. Barnes was the breeder and is still the owner. The Second Dr. McHale, like his sire, is a white bull, and very like him in his general outline; but he is much fuller in the twist and thighs than his father was at his age. His back is very good, and so likewise are his loin and flank. Dr. McHale has got much first-rate stock, and his namesake is decidedly about one of the best. All his stock come out well as they get age, and we should therefore expect the cup bull of this year to be something very good indeed by another season. He has been bought by the Marquis of Waterford, who will likely do him justice. The second two-year-old bull at Dublin, was Mr. Eastwood's Hero, the first in his class at Worcester, and this award will allow many to form some idea of the comparative merits of Mr. Barnes's bull, for Hero is a bull of great substance, with quality of a high order. A very substantial bull of Mr. Chaloner's was placed third, and so good was he that many considered he should have stood higher, particularly when his youth was taken into account; for if his birth had only been a fortnight, or even less, later than the date on which it occurred, he would have ranked among the yearlings, when he would unquestionably have distanced every other competitor in that section, with a chance for the Challenge Cup as the best in the yard. The commendations in the section were divided among the bulls shown by the Earl of Caledon, Mr. J. G. Wood, and Lord Waterford; while Lord de Vecaci's Crown of Lothian was highly commended. This is the same bull that won the first yearling prizes last year at Dublin, and first also in his class at the Kilkenny Show of the Royal Agricultural Society of Ireland in August, but he has not improved as he ought to have done, considering that he has been very well taken care of in the interval.

That large and by no means fine bull Field Marshal the Second, belonging to Lord Waterford, which was first in his class at Kilkenny, was again first last week in the three-year-old bull section. We never liked him, for he is but a vulgar bull in many respects, and he is only fit for crossing common dairy cows. Mr. Barcroft's Lord Aberdeen, which was placed second, is far and away a better bull as a shorthorn, one in fact that a breeder would use with pleasure, which is not the case with the other. Mr. Barcroft's bull is of the Sittyton Lancaster tribe, and got by Lord Raglan (18244). Lord Waterford had another of his Foundation bulls put third, and in many respects that bull is a better one than his owner's first winning animal. Colonel Lealie's Lord of the Vale, a bull of beautiful quality, got by Booth's Lord of the Valley, was highly commended; Mr. Barnes having a half-brother of Dr. McHale the Second commended—a similar honour being awarded to Capt. Goff's rather uneven Publican, which had been bred by Sir A. de Rothschild.

There were eight or nine capital old bulls, besides others of an indifferent description, but most of them were in condition for slaughter. This was not the case, how-

ever, with Mr. Butler's Soubadar, whose career, with the exception of his meeting last year with Royal Butterfly, has been an uninterrupted series of victories, and he still looks as like a winner as ever. He is not only a bull of great substance, but of very rich quality, well proportioned, and very even all over, while the rich roan colour of his good coat of hair is exceedingly taking. Last week he got the first prize in his section, the Gold Medal as the best of all the prize bulls, and the *Farmer's Gazette* plate as the best of any age, sex, or breed. The second bull in the section was another which has done the State some service, and appears likely to do much more before he becomes beef. We refer to Lord Clyde, a Welcomed Guest bull, bred by Lord Dufferin, and used by Mr. Anderson, Co. Waterford, for several years, during which time Lord Clyde left a number of winning heifers of a first-rate stamp with his owner; in fact, he made Mr. Anderson's position as a breeder, nearly all the heifers, at least, got by him, having been winners at the principal Irish shows. Mr. Baker's Victor Emmanuel, bred by Col. Leslie, out of Turfoida by Earl of Dublin, was highly commended. This was the first yearling at the Belfast Meeting of the Royal Irish Agricultural Society in 1861, and he has been a winner several times since that date. He is a good bull, although he has nothing of the wealth of Lord Clyde or Soubadar. Col. Leslie's Prince Roland, whose great fore-end, if matched by equally good quarters, would have rendered him much more formidable than he has ever been, was also highly commended. He was bred by Lady Pigot, and though of great promise originally, has never got beyond a second at any of the principal Irish shows. The commended bull of the section was Clydesdale, the prize Cork Royal two-year-old, the property of Earl Fitzwilliam, and bred by Mr. Tynte, from a Vanguard cow. He was shown in fat stock condition, and we should imagine that he has become beef, seeing that Lord Fitzwilliam has secured Mr. Chaloner's third prize two-year-old to supply Clydesdale's place.

The yearling heifers were very nice, and the places of the selected very fairly, allotted. Mr. Ball's Wood Belle, a stylish heifer of good quality, being first. Mr. Welsted's Anita, a very beautiful and exceedingly promising heifer, second, Colonel Leslie's Lily Warlabby, a punchy style of heifer, third. A strong, substantial, and not very fine heifer, belonging to Sir Robert Paul, was fourth on the list; but Mr. Eastwood's Rosette the Second could only get the length of a commendation, Mr. Ball obtaining a similar compliment for two other heifers he showed in the section.

A great deal of the interest of the Show centred in the two-year-old heifers, owing to the high qualifications of the three leading animals. It took a considerable time to adjust their relative positions, and when they were finally turned in, it was found that Mr. Barcroft—the well-known owner of Sir Colin—had got the first prize and the Gold Medal for the Maid of Rocklands, a heifer which has a very beautiful fore-end, and by no means defective thighs and twist. She is by the Duke of Geneva, out of a cow bought from Mr. Richardson, of New York, but sprung from Mr. Chaloner's herd. Then Col. Leslie's Queen of the Seas by Dr. M'Hale, out of Baroness by Baron Warlabby, whose make-up over the shoulder is very superior, was put second, followed by a high commendation, to Mr. Ball's Woodflower—the same heifer that beat Colonel Towneley's Double Butterfly at the Dublin Spring Show last year. Woodflower is really a grand heifer, but she had evidently been rather overdone in the making up of her condition for showing. The Maid of Rocklands was not brought out twelve months ago, being too young at that time.

Mr. Barcroft was also the winner in the three-year-old section, with a fine even heifer of good quality, which

he got last year from Shethin, and that is by Cherry Duke the Second. The second prize in the section went to a strong, but not stylish heifer, shown by Sir A. E. Bellingham.

The first prize for aged cows went to Mr. Bloomfield's Blue-bell, a cow of great quality, and still very shapely, notwithstanding her age. Mr. Warburton's Pineapple, originally a Wallscott cow, took the second prize; and Mr. Whaley's Mamelita, the gold medal cow of last year, was highly commended.

The miscellaneous breeds comprised Scotch polled, Herefords, Devons, Keries, Ayrshires, and Alderneys. Of the polled Angus, the principal animals were those exhibited by Mr. Owen, Blesington, who has taken a good place as a breeder of this valuable description of cattle, and his polled bull, bred by Sir John Sinclair, Scotland, the same bull which got the medal at Kilkenny, is a lengthy, improving animal, particularly good in the shoulder. Several Herefords, from the late Lord Berwick's herd, were taken to Ireland on the dispersion of that herd, and of these and their produce good specimens were exhibited by Mr. J. O. G. Pollok, Mr. Reynell, Mr. Fetherstonehaugh, and Mr. Kearney; Mr. Reynell's bull, Cropper, bred by Lord Berwick, and his half-sister Mr. Pollok's cow, being the best in the Hereford sections, and cattle of grand quality. Mr. Boyle had a sweet low-set Devon bull, bred by Mr. J. Wentworth Buller, M.P., which got the prize in his class. In Keries there was nothing very particular, and, strange to say, not a single prize went to Kerry, the headquarters of the herd, the best specimens being shown by people who keep them as fancy stock. Lord Clermont and Lord James Butler were the principal exhibitors of Ayrshires, of which few were shown; and in Alderneys Mr. Dingwall, Mr. Drury, and Mr. Connolly, M.P., took the lead.

The show of fat cattle was very good, the best of all the fat cows of any breed being a remarkably superior Hereford shown by Mr. J. O. G. Pollok, but which had been bred by the late Lord Berwick. Her finish and quality were splendid. Next to her we would place Mr. Barton's Shorthorned ox, and Mr. Low's Shorthorned cow, both well-finished animals.

The show of sheep was not large, but very select. Mr. Owen took the lead, as usual, in the Leicester sections, his first prize shearing ram being Col. Inge Worcester winner, the same ram with which Mr. Owen took the Challenge Cup in the long-wooled classes last August at Kilkenny. There were some capital specimens of the Border Leicesters exhibited, particularly Mr. Thomas Robertson's two-shear ram, bred by Lord Polwarth, and Mr. Franks' ewe hoggets. In long-wooled sheep not Leicesters, the best lot in any section was the three Cotswold hogget rams exhibited by Mr. John Wells, Hampnett, Northleach, and Mr. Beale Browne had also some good lots in different sections. The two Shropshire shearing rams, belonging respectively to Mr. C. W. Hamilton and Mr. P. Broughton, which contested so closely the short-wooled Challenge Cup at Kilkenny, competed again last week, when the Kilkenny winner, Mr. Hamilton's ram, was beaten by Broughton's sheep, got by Mr. Horton's Leeds first prize ram, Lord of the Isles. Those gentlemen also exhibited capital lots in the other sections of Shropshires. Lord Clermont was the only exhibitor of Cheviots—a breed not much attended to in Ireland, although there are extensive tracts of country well suited for it. The show of fat sheep was small, but good on the whole, particularly Colonel Tottenham's three-year-old Shropshire widders.

In the Swine section Lord Clermont's boar, eighteen months old, bred by Mr. Hewer, Wilts, which had been the first prize boar in his section last June at Exeter, and second at Worcester, was second in the section in which

he was shown at Dublin, the first prize at Worcester having also been exhibited and beaten at Dublin in the same section, where he was not a winner. Mr. James's Worcester prize sow only reached the honour of a high commendation, being beaten in her section by Mr. Malcolmson's sow, bred by Mr. Joyce, but got by one of Mr. Hewer's boars, and by a handsome sow bred by Lord Clermont, who showed her. His lordship and Mr. Joyce were successful in other sections.

The show of horses, and that of poultry, do not call for any particular notice.

The implement department was a scene of confusion, from the confined space allotted to it; nor was it all arranged even on one plan, but scattered here and there in every bye-corner, so that people had the greatest difficulty in finding out what they wanted. Several of the leading English firms have given up attending the Royal Dublin spring shows on this account; and many of the exhibitors in the department were people who vend little knick-knacks and other matters which cannot be considered agricultural implements. The principal English firms present were Howard, Bedford; Garrett and Sons, Saxmundham; Hornsby, Grantham; Barrett, Exall, and Andrewes, Reading; Young, Ayr; Boby, Bury St. Edmunds; Ashby, Stamford; Richmonds and Norton, Liverpool; Hill and Smith, Dudley; Smith, Thrapston; Barrows and Carmichael, Banbury; Bentall, Maldon; Pickaley, Sims, and Co., Leigh; Clay, Wakefield; Perry, Bilston; James, Cheltenham; Eastwood, Blackburn; Fry, Bristol; Morton, Liverpool.

There is always a formal meeting of the Society held on the Wednesday evening of the Show, over which the Lord Lieutenant presides, and at which the prizes are officially announced. On Thursday evening a Special Meeting was held, at which Mr. J. B. Lawes read an elaborate paper on the scientific principles involved in feeding stock. Notwithstanding the nature of the subject, and the well-known ability of the lecturer, the attendance was thin, and the members of the Society were conspicuous by their absence. It evidently requires the attraction of a Lord Lieutenant to draw a full meeting of the members of the Royal Dublin Society.

EVENING MEETING.

The evening meeting of the Royal Dublin Society for the announcement of the prizes awarded to the successful exhibitors was held in the Society's Lecture Theatre, which was occupied by a numerous and influential assembly.

Lord DUNLO said it devolved upon him to open the proceedings, and in doing so, he would, in the first place, congratulate the meeting upon having the honour of being again presided over by the Lord Lieutenant, who had upon every occurrence, when opportunity permitted, shown the warmest interest in the Royal Dublin Society. He was sure, from what his Excellency had seen of the show that day, that he felt satisfied it was equal, if not superior, in point of quality, to any which he had previously observed. It should be considered as a proof of the interest shown in the development of agricultural resources of this country, to see the names of those with whom it should be most associated the patrons of the society. It was most gratifying on every occasion that their proceedings were patronised both by his Excellency and many persons of rank. He believed that that day's exhibition would, in every particular, not only in the quality of the animals exhibited, but by the amount of patronage accorded by the public, prove equal to any that has gone before. He did not mean to take an idea of the condition of the country from the appearance of that day's show, or similar exhibitions; but he did say that they proved at least that there was in this country the seed, if he might so speak, of good material for agricultural purposes; that there was in this country also those who were anxious to bring this seed to maturity. The society had mainly to depend upon its own exertions and upon those of its friends. Amongst these they were proud to be able to

name his Excellency. Although the society, he might say, had seemingly been under a kind of cloud of late in some quarters, yet it was progressing. He did not wish, however, to refer to that. It would be wrong in him, however, not to impress upon all present the fact that the society was honestly and conscientiously performing its duty in all the several matters which they had undertaken to forward, and especially in that department which they had just been seeing. He would not omit to mention an official letter to the secretaries of the society relative to flax culture, in which it was particularly interested; and the contents of that letter testified to him the estimation in which the society was held by others besides his Excellency; and he felt, trusting in that, that they should more than realise that which they had been anticipating for some time—the entire success of the society in every department.

Dr. STEELE then read the list of prizes.

Captain LINDSAY, D.L., in proposing a vote of thanks to the Judges, said that the task which they had had was no easy one; but their awards had, nevertheless, given general satisfaction, and he had great pleasure in moving "That the best thanks of the society be given to the Judges who had so kindly acted for the society."

Mr. G. W. MAUNSELL said that it now devolved on him to second the vote of thanks which had just been proposed to the gentlemen who had so kindly and efficiently acted as judges. It would be plain that if there was any feature in which the superiority of the society's show had been established, it was the accuracy and efficiency with which the judges discharged their onerous duties. In speaking of the importance of impartial decisions, he said that the award was not represented by its nominal value in the sovereigns received at the time, but it was one that influenced the substantial value of stock. On that occasion it so happened that they had the advantage of gentlemen as judges who had no superiors in the world (Hear). They had Messrs. Stratton, Drury, and Unthank, in shorthorns, Mr. Jordan in sheep, and Mr. Turner in swine; and it would be sufficient to say that on no occasion had the society had the duty more satisfactorily performed. He would call the attention of the society to the result of the judgments. The society prided itself in the fact that they were not of the metropolis, or of the metropolitan county only—they gathered round them members from every part; and a glance at the prize list, which had just been read by Dr. Steele, would show them that the prizes had been won by exhibitors from north, south, and west. On a previous occasion they had to recognise Tipperary as the winning county, and the prize list again told them that they had to recognise it as such in its best bull, Soubadar. But if Tipperary was first in bulls, Dublin was first in heifers, and Mr. Jaffray Barcroft carried away with him to his villa farm at Cabinteely the first prize in his Maid of Rocklands (Hear, hear). The speaker here entered into a review of the prizes for the past few years given in the different classes, and mentioned the counties to which they had gone, for the purpose of showing that they had been almost equally distributed over the various agricultural counties and districts in Ireland. In speaking of the breeds of Herefords and shorthorns, he said that the display of the former class had been very creditable. They could be bred as well as any other class, and it perhaps would yet be a question whether they had not carried the breeding of shorthorns too far. Devons were well represented by Monaghan. In Kerry they had got a large and increasing variety. Dublin had been first in Kerry cows, but it had been closely followed up by Down, in Lord Annesley's, and by Waterford, in Mr. Drew's. It was, however, remarkable that Kerry was nowhere in Kerry cows. With regard to Alderneys, they had a stock well worthy the consideration of those who looked for rich milk and butter. That class had been well represented by Mr. Drury, of Dartry, Rathmines. In speaking of fat stock, he said that one new feature in that class had appeared. Nobody thought that fat stock could be finished anywhere but in Meath. Now, however, it would seem that Cork, Tipperary, and other counties could finish them as well. In concluding his lengthened and able review of the present and previous shows he said that he must not omit to mention one important change. The old and expensive system of erecting sheds had been done away with; the shoulders of the agricultural com-

mittee had been relieved of £500 annually, and thus they were able to increase the amount of prize money. The prosperity of the country he considered to a great extent depended on the prosperity of the shows, and he felt certain that so long as they were fortunate enough to have such competent and impartial gentlemen as judges they would contribute much to its prosperity, and he had very great pleasure in seconding the vote of thanks to those gentlemen who had just brought their adjudications to an end.

His Excellency put the motion from the chair, and it was carried by acclamation.

Mr. DRURY, one of the judges, acknowledged the compliment, and in doing so said that they had experienced considerable difficulty, owing to the prevailing good quality of the animals, in arriving at a decision. They had, however, done their best. He was sure that all would not, however, be satisfied. He suggested that more space should, if possible, be given in which the animals might be viewed by the judges. He concluded by saying that he felt grateful, on the part of himself and fellows, for the compliment which had been paid to them.

The Hon. GEORGE HANDCOCK said it now became his duty, on behalf of the Royal Dublin Society, to move a vote of thanks to the Lord Lieutenant for his kindness in presiding over the meeting. They were much indebted to his Excellency, not only for coming amongst them that evening, but on every occasion when the society was likely to derive advantage from his presence. It was but a short time since his Excellency occupied the chair, and distributed the prizes to the pupils of the School of Art; and he (Mr. Handcock) was sure it would be a gratification to him to know that the few kind words he had addressed to them on that occasion had made a deep impression, and induced them to labour harder for the future (Hear, hear). With regard to the Royal Dublin Society, it was now in a green old age, being 133 years in existence. But when they looked at the shows, the animals exhibited, and the manner in which the business was conducted, he thought it would not be out of place for him to say that it was still in the vigour of youth (Hear, hear). It was most gratifying to them to hear the description of the cattle which had been given by Mr. Drury, and to know that they were progressing in that particular department. He wished he could say the same with regard to the agricultural population. It had been mentioned on a former occasion by Mr. Naper that he considered the peasantry of the country were twenty-five years behind the animals. That was not the fault of the Royal Dublin Society, the Legislature, or the landlords (Hear, hear). It was a matter over which it was impossible the society could exercise any control. With respect to another great movement now going on in this country, he wished to make an observation. He alluded to emigration, which was undoubtedly very great; but the agricultural portion of the community need be under no apprehension that they would be left without a sufficient number of labourers to do their work (Hear, hear). He had been furnished with some statistics from a railway company, from which he learned that in 1862 27,200 members of the working population travelled by the line. In 1863 the number was 26,580. All these went to England, earned money by their labour there, and returned to this country, and did not emigrate. They did what the merchant and the trader did—namely, sold their labour in the best market. It had been said that they wanted people to till the ground; but when he mentioned that there went to England from all parts of Ireland some forty thousand men every year between spring time and harvest, and who returned home again, he thought he might say when it came to this with us, that the labourers would get here the same amount of wages that they received in another country, they might expect them to stay at home, but not till then (Hear, hear). They had learned that evening that a sum of £2,000 had been placed at the disposition of this society to further the flax movement; and he could assure them that the Royal Dublin Society would assist in every way in carrying out that object, or any other intended for the benefit of the country (applause). Having expressed a hope that the Lord Lieutenant would soon be solicited to open the Exhibition of Manufactures, the hon. gentleman concluded by moving the vote of thanks,

His EXCELLENCY, who on rising was received with applause, said: My Lords and Gentlemen, I believe I may gather that that resolution, or vote of thanks, which has been so kindly proposed by Mr. Handcock, has been endorsed by your acceptance (Hear, hear). I can assure you that I receive it, as I have always done similar demonstrations in this theatre, with great gratitude (Hear, hear). I feel particular pleasure in thinking that I may be confident that the show which we have witnessed this day was one of continued and growing success (Hear, hear). There are many here—and I think I might content myself by referring to the very instructive and exhaustive speech of Mr. Maunsell (Hear, hear)—who can speak with a much nicer degree of discrimination on the peculiar merits of that exhibition; but its general success must have been obvious even to spectators as unqualified and superficial as myself. It is very pleasing to perceive, every time I come here, that the Royal Dublin Society has provided fresh appliances and new accommodation—new sheds, and yards, and galleries—so that we are no longer obliged to close up Leinster Lawn, but may resign its unbroken sward either for flower-beds or parterres, or for the statues of more Irish worthies. I feel that when I take occasion to commend the exhibition of live stock, upon this and similar occasions, I run one risk. I know that I am liable to be told that I made much more case for the cattle and the sheep and the swine, perhaps, even for the poultry of the country, than I do for the nobler species of man himself, and that in my anxiety to prove that Ireland ought to be the mother of flocks and herds, I comparatively leave out of sight, and do not care what becomes of Irishmen. If I thought that this required a serious answer—which I do not think it does (Hear, hear, and applause)—I might say what I have reiterated on former occasions of my approval and sympathy with that effort which the Royal Agricultural Society has made to promote the better construction of cottages for the agricultural labourer (Hear, hear). I might also say that I have taken the most public opportunities I could find for giving vent to my regret that the bone and marrow of the rising youth of Ireland, instead of being expended in wholesome labour on their own fertile soil, should be left to rot and moulder on the far battle-fields of America (Hear, hear); but, gentlemen, I humbly conceive that to furnish them with that employment which I covet for them—to secure them those wages which I fain would see reward their well-directed labour—there can be no method so obvious or so sure as those processes which this society, and, in conjunction with it, the Royal Agricultural Society of Ireland, have for their special province, that is, to improve in every point the agriculture of the country, to perfect every breed of animals employed in husbandry, to make generally known and to bring into common use the most useful implements where occasion may invite, to furnish new growths and new crops such as that to which we have heard allusion made, the growth of flax in this country, which I rejoice to see has received the co-operation of this society (Hear, hear); and, in a word, to increase the mastery of man over nature (applause). It is precisely in this spirit and this direction that the poet, having said in the line, addressing his country and calling it

“Magna parens frugum,”

In the next says,

“Magna virens.”

I believe this is not a fanciful connection; but is from a well-farmed country that we are most likely to see emerge an industrious, contented, and honest peasantry (applause). Thanking you for the kindness with which you have received the mention of my name, I hope that we shall have the pleasure of witnessing in the noble yard of this society many more shows, whether I am here to see them or not, as large and as full of promise and of hope as that we have had the pleasure this day of seeing (loud applause).

THE RISE AND PROGRESS OF THE STUDLEY, KILLERBY,
AND WARLABY HERDS OF SHORT-HORN CATTLE.

THE KILLERBY HERD—*continued.*

SIB.—The Mantalini tribe next demands our attention. This family, which has since attained a European fame, came to Killerby from Cleasby by the purchase from Miss Wright, Mrs. John Booth's sister, of Sylph by Remus, and it is a singular circumstance that when it came to Killerby the family had already passed through the hands of two of those four spirited breeders who jointly purchased at Mr. C. Colking's sale the bull Comet for the princely sum of 1,000 guineas—Colonel Trotter and Mr. Wright. In Colonel Trotter's hands this family go back to those very early times of which all records are lost; and this probably accounts for the circumstance that while, in modern times, the pedigree of the Mantalini concludes with "Strawberry by Son of Favourite (252), dam Strawberry," in all the early pedigrees of Colonel Trotter's cattle the dam of Strawberry by Son of Favourite is called "Hollon." In one of them she is said to be "Hollon, bred by Mr. Hollon, of Strepsans, near Darlington;" and, in another, "Hollon, by a son of (Mr. Charge's) Dalton Duke (188)," which connects them with the third of the four purchasers of Comet. As might have been expected in cattle coming out of such hands, Mr. J. Booth's new purchase, Sylph, was full to overflowing of the blood of Favourite. Her grandam Alpine and her great grandam Strawberry were both by sons of Favourite; her dam Matilda was by a Son of Comet, who was both son and grandson of Favourite, while she was herself by Remus, whose sire was not only a son of Comet, but whose dam and grandam were both by sons of Favourite. It can be no cause for surprise that such a family descended from such blood, and, crossed by such bulls as Pilot, Alderman, Matchem, and Marcus, gave origin to a cow so splendid as Mantalini, the winner of twelve first-class prizes at four years old. Mantalini, though on a less scale than Bracelet or Charity, was a very true made cow, on whom it would have been difficult for any one to make a disparaging criticism. Though wanting, perhaps, somewhat of the imposing grandeur of the Isabellas, or the massive development of Queen of the Ocean, she was a beautiful animal, and an excellent dairy cow. Nor, though Warlabby and Killerby see them now no more, is the fame of this noble family yet extinct. Westland, the Killerby of the Sister Isle, can boast of worthy representatives of it in Sylph, Baroness, Miss Warlabby, Dr. McHale, Victoria (sold to Lady Pigot for 500 guineas), and others descendants of Modiah and Mil-liner, a sister and daughter of Mantalini, purchased by Mr. Barnes of the late Mr. J. Booth; and from Mantalini's daughter Pelerine (sold with her twin sister Polka to Colonel La Touche) come Mr. Douglas's three Graces, Rose of Autumn, Rose of Summer, and Rose of Athelstane, of whom it is sufficient to say that Rose of Summer had the unparalleled honour of winning the first prizes at the three national shows in 1854, and her daughter Rose of Athelstane in 1857. Seventh in descent from Sylph, and third from Mantalini, the beautiful cow Farewell by Royal Buck, then a yearling heifer, was sold at Mr. J. Booth's sale in 1852. She is now the property of Mr. Storer, of Hellidon; and some idea of the merits and fecundity of this family may be formed from the circumstance that, though nearly thirteen years old, she has milked deeply for the last nine months, having previously

given birth to ten living calves, and is believed to be again in calf. Of these, Claribel and Christabel, twins by Valasco, Lady Superior by Monk, and Imperial Windsor by Windsor, are at Stackhouse; Mantalini Prince by Lord Chamberlain, at Mr. Storer's, and Viscount Killerby at Mr. Hewer's, of Sevenhampton. She is also, through her daughter La Vallière, now the property of the Duke of Montrose, the grandam of Mr. Ambler's celebrated prize bull Prince Talleyrand.

From another cow of Mr. J. Booth's, called Belinda, sprang Young Matchem (2282), and from her grand-daughter May Day] the bull Marcus. The latter by Pilot, from a dam who was Brother to Orpheus, after doing good service at Killerby, as may be seen in the pedigrees of many of its best families, was sold with a cow called Yorkshire Jenny, to Mr. John Bolden, to go to Australia; but they were lost in a storm. Yorkshire Jenny appears to have had no pedigree except one cross of Priam. She was the winner of the second prize in the cow class at North-allerton, in 1843.

Another cow called Rubicon, by Priam, appears to have had numerous descendants now dispersed. Mother Red Cap, sold to Mr. Fawkes, and her son Red Knight, winner of the first prize for two-year-old bulls at Lewes, were descended from her.

The Belinda and Mother Red Cap tribes seem to have originated, like the Mantalini and Floranth families, in the stocks of Miss Wright and Mr. Charge.

It is curious to trace the family connexion that existed between the first improvers of the Shorthorns. Mrs. Thomas Booth was a sister of Major Bower. Mr. Wright, one of the purchasers of Comet, was the father of Mrs. John Booth, and brother-in-law of Mr. Charge; and the last gentleman's sister married Mr. Colling, of White House. Mr. Charge still survives, having exceeded, by more than twenty years, the allotted term of man's sojourn here. In the Booth family alone the taste for Shorthorns seems to have been an hereditary predilection. Whilst the names of nearly all the earlier breeders have disappeared from the Herd Book, that of Booth is still conspicuous; and part of the old Killerby herd is now in the hands of the third generation.

It has been observed that the bull Matchem appears as the sire of some of the cows in the Killerby herd of the period at which we resumed the account of it. This is the same Matchem that Mr. Bates's Oxford tribe commenced with. He was purchased at Mr. Mason's sale, by Mr. John Booth, and Mr. Maynard, of Harlsey. On looking over the pedigrees of the Booth cattle, however, it will be seen that a bull of alien blood has never been used *through-out* the herd; for Matchem and Exquisite were only very sparingly employed, but one or more of the best cows has been crossed with the bull selected, and the male produce made use of. If the progeny resulting from this half-cross proved unsatisfactory, they were either disposed of, or subjected to a course of extra close interbreeding. Of the early experiments of this nature the cross of Matchem appears to have been the most successful, and of the more recent ones the crosses of Lord-Lieutenant and Mussulman, the former of which was adopted by Mr. Richard Booth, in the year 1839, for his cow White Strawberry, and the

latter, in the same year, by Mr. John Booth, who sent his famous cow Bracelet to Colonel Cradock's Mussulman of the Grand "Old Cherry" blood, and a son of the famous old cow by Pirate, who bore that name. Good as that blood was, Mr. J. Booth does not appear to have introduced this cross, with a view to engraving on his herd any particular excellence exhibited by Mussulman which was wanting in his own cattle, but rather to have been acting in conformity with the general practice of cattle-breeders of that day, who seemed to think it a matter of course to effect, at certain intervals, some change or renewal of strain in their stock. There is a prevalent idea that the length of hind-quarter which distinguishes the Warlaby cattle was derived from Mussulman, but for this there seems to be no sufficient foundation. The lengthy hind-quarters had long been a characteristic of the Booth herds. The early bulls, Rockingham, Sir Henry, and Julius Cæsar, and the cows of that time, especially Gaudy, could not be excelled in that point by any animal of the present day. Bracelet, as many will remember, possessed this length of quarter in a remarkable degree, as did also her granddaughter Gem. It was sufficient for Mr. J. Booth that he saw in Mussulman, not merely the fortuitous possessor of equally valuable properties with those which his own herd could boast, but the inheritor of them; for being descended from the stocks of Messrs. Wright and Charge, who, as we have seen, were of the family coterie of Shorthorn breeders, Mussulman's ancestry had all been well known to Mr. Booth for generations.

It has been asserted by over-zealous advocates of the system of close interbreeding, that the crosses of Mussulman, Lord Lieutenant, Matchem, and others introduced scarcely any fresh blood into the Booth herds; for inasmuch as no alien bulls were used but those whose veins were surcharged with the blood of Favourite, the recourse to them was nothing more than a recurrence to, or renewal of, the old family strain; but this is really only what is true of every well-bred Shorthorn of the period, and therefore proves nothing. Take any one of them, and trace back the pedigree of each of its progenitors (whose numbers of course increase each generation back in a geometrical progression), and this bull Favourite will be found to recur directly and indirectly a surprising number of times. I am indebted to my friend Mr. Storer for the following elaborate calculations, which I quote in illustration of this:—Mussulman is 64 times descended from Favourite, viz., through Magnum Bonum 80, through Pirate 22, through Houghton 9, through Marshal Blucher 8; total 64 times. Lord-Lieutenant was 106 times descended from Favourite, and Matchem 52 times. Crown Prince is 1,055 times descended from Favourite, and Red Rose, by Harbinger, 1,844 times. So the produce of the two are descended from him 2,899 times. But work out the Duchesses or any Shorthorns of good blood, and the result will be found very much the same. It will not do, therefore, to claim bulls as of kindred blood on this ground only. Moreover, it must in candour be admitted by the advocates of in-and-in-breeding that a careful consideration of the above facts leads to one unavoidable conclusion. Very strong in-and-in-breeding is a totally different thing in our case from what it was in the case of the earlier breeders, the Collings and Mr. Thomas Booth—so different that there can be but little analogy between the two cases. They bred in-and-in from animals which had little or no previous affinity. We breed in-and-in from animals full of the same blood to begin with. In our case the *via media*, and therefore the *via salutis*, would seem to lie in the adoption of two apparently opposite principles—in-and-in-breeding, and fresh blood. It is manifest, however, that this latter principle should be acted upon with extreme caution, or to a very limited extent, when it is desirable to preserve and

perpetuate the distinctive type of any particular tribe, especially when, as in the Warlaby herd, there is no visible deterioration in symmetry, substance, or stamina, or any want of fertility traceable to in-and-in breeding. Yet even in such cases it is doubtless advisable to have occasional recourse to remote alliances, taking care to have as many removes as possible between members of the same family; or, where using bulls nearly related to the cows, giving the preference to such as have been subjected to different conditions of life, it being a well-known physiological fact that a change of soil and climate effects perhaps almost as great a change in the constitution as would result from an infusion of other blood.

In July, 1852, the Killerby herd was sold by auction; and the sale was attended by breeders from all parts of the kingdom. There was unfortunately, however, at this time, a general depression in the value of all agricultural produce, and the cattle did not realize prices at all adequate to their merit and celebrity. Some of them have since been resold for three times as much as they fetched at the sale. Venus Victrix, the daughter of Bloom, brought the highest price. She was purchased by Mr. R. Booth for 175 guineas, and presented to his brother. In the report of the sale in the *Mark Lane Express* it is stated that, "since the formation of the Royal Agricultural Society of England, in 1839, the prize for the best cows has been gained either by the Messrs. Booth or by animals bred from their stock, with the exception of the two first meetings, when they did not exhibit, and that of 1843. The animals which took the prizes on the two former occasions were both afterwards exhibited against, and defeated by, Bracelet.

After the dispersion of the herd, Mr. J. Booth entered only very partially into the breeding of Shorthorns. Venus Victrix's first calf died. She afterwards produced the two well-known bulls King Arthur and King Alfred, both by Crown Prince—the sires of many a noble Shorthorn, and the earners of many a golden guinea for the treasury at Killerby—and two as-beautiful heifers, Victrix by Royal Buck, and Venus de Medicis by Harbinger; after which she fell into one of the ditches at Warlaby, whither she had been sent to Crown Prince, and, becoming partially paralysed in her hind-quarters, was fed off.

Venus Victrix was a cow of exceedingly good form. Her back was broad and level, her ribs well arched, her breast heavy and wide, and her thighs full. Her weak point was that which is usually found in conjunction with good milking qualities—a little want of substance in the neck and chine. She won five prizes at the Royal and Yorkshire shows. Her daughter Victrix gave birth to Venus Astarte, a lovely heifer by Baron Warlaby, which did not breed, but took the first prize for extra stock at the fat show in York in 1861. Victrix's next calf was retained for fifteen months *in utero*; and after getting rid of it she fell in-calf again to Windsor, and aborted, since which, all hope of her breeding is at an end.

Venus de Medicis was a very symmetrical heifer. She was of great breadth, was thickly fleshed, and had very finely-finished quarters. She was sold to Mr. Douglas for 300 guineas, and sacrificed to the Goddess of Display. After winning several prizes, she cast a calf at the Paris Exhibition; and her chance of any further increase is more than doubtful.

In proof of the fluctuations to which the procreative power of high-bred bulls is subject from various causes, it may be here mentioned that Venus's son King Arthur was returned by his hirers as unfruitful, shortly after which he was relet to Mr. Bruere, and became, in the first year, the sire of eighteen calves. He was again let into Ireland, and there begot only two calves. He re-

turned home, was relet to Messrs. Wood and Lawson, and gave entire satisfaction. Mr. R. Booth's Prince George, half-brother of Monk, affords another instance of this. He was returned to Warlaby as useless. Mr. Bruere had been so successful with King Arthur under similar circumstances, that Prince George was sent to him, King Arthur's term having just expired. In his first season at Mr. Bruere's, Prince George was the sire of twenty-eight calves. He is now in his fourth year there, and is twelve years old.

It is matter of frequent experience with Mr. Booth, that bulls are frequently sent back to Warlaby as unfruitful, which yet impregnate cows the very week of their return, and afterwards prove very useful in some other herd. It is a fair inference from this fact, that the fault in these cases lies quite as much in the herdsman, the cows, the situation, or the diet, as in the bull. To study the peculiar temperament of these sultans of the herd is not the least important task.

"That to the faithful herdsman's art belongs."

In one bull pride predominates—his dignity must be respected—he must not be hurried or struck; in another modesty prevails—he must not be watched; one is apathetic, and requires to be roused to exertion; another is timid, and encouragement is necessary; one requires a generous regimen and comfortable housing; another (and this is true of most bulls) requires natural food, grass, hay, and turnips, and, above all things, that which is indispensable to the vigour and potency of all animal life—daily exercise.

Though the great Killerby Herd had been dispersed, and its queenly matrons consigned to other hands, the family taste for Shorthorns lingered still, like a presiding genius, on the accustomed spot. A few good animals of shorter, but distinguished, lineage were retained, and these have given rise to other families, which, if more recent in their origin, are proud to trace that origin to the hands of the Booths, and the quiet meadows of old Killerby. Some of these were disposed of by the late Mr. John Booth, while he yet lived, and several of them went to Stackhouse.

One of these importations from the Valley of the Swale to that of the Ribbles was old Calomel, a very useful white cow by Hamlet, tracing back, through dams by Leonard and by Buckingham, to the once celebrated herd of Sir Matthew White Ridley. Before she went to Stackhouse, Mr. J. Booth had sold for high prices her bulls Royal Favourite and Poltalloch—the first to Mr. Heneage, the second to Australia. After she arrived there she bred several valuable things, and her daughters and grand-daughters yet remain, two of them at Stackhouse, and the others in the herds of Mr. Storer and Captain Spencer.

A not less valuable importation from Killerby to Stackhouse was the neat cow Mistress Mary, with crosses in her pedigree of Baron Warlaby, Royal Buck, Hopewell, and Hamlet. After producing for Mr. Carr a bull, sold to the Duke of Montrose, and a beautiful heifer, Rose of Windsor, to Captain Spencer, Mistress Mary was sold, when in-calf to Valasco, to Lady Pigot, and Modred, the produce, an excellent heifer, is now in the Hellidon herd. The Knowmire herd also possesses a very pretty heifer of this family, Water Sprite, by Valasco, the dam of a promising young bull, Sir Lancelot, with five first-rate crosses of Mr. Booth's bulls in his pedigree. Another Killerby cow, Pauline by British Boy, with the further crosses of Hopewell and Hamlet, a cow remarkable for her massive fore-quarters, was purchased from Mr. Carr by Mr. Storer. She was in-calf to Windsor, and her daughter by that bull has given rise to Mr. Storer's Killerby Roses, which promise to transmit her and his perfections. One of them, a yearling heifer by Viscount Windsor and from

a dam by Windsor, is the *Belle* of the Hellidon herd, and the perfection of symmetry.

Of the cattle which remained at Killerby, and descended at Mr. J. Booth's much-to-be-regretted death in 1857 to his sons, we have previously mentioned Venus Victrix and her family: they were the Prima Donnas of the herd. Another most valuable cow, though of more recent origin, remained at Killerby at Mr. Booth's death—Hecuba, by Hopewell, from a dam by Hamlet, out of a Leonard cow. This cow has all the Booth character, and transmits it to her offspring. She is in colour a dense red; not very large, but deep; long and massive; a large animal on short legs; when not in milk, laying on flesh with wonderful rapidity; and when in milk, she is what every cow ought to be, a great and deep milker, with an udder whose size and form might provoke the cupidity of even a London dairymen. She has had eight living calves, and is consequently well on in years; but when young she was pronounced by one of the best of judges, Mr. Eastwood, to be the very type of the true Shorthorn, the very model of a bull breeder. One only of her daughters has been sold, Lady Killerby by British Boy, long the ornament of the Stackhouse pastures, and now of those of Hellidon—a cow of which it would be impossible to speak too highly, if only she would imitate her dam's fertility, and reward her owner's patience with heifer calves.

Fortunately, the Messrs. Booth have been much more successful with Hecuba's progeny retained at Killerby. Who that knows anything of northern herds knows not her lovely daughters, Forest Queen by Royal Buck, and Queen of Trumps by Welcome Guest? Her beautiful grand-daughter, Wood Nymph by Sir Samuel, was sold to Lady Pigot, and often noticed by the visitor to Branches. She was the parent, by Prince Alfred, of Lady Pigot's victorious bull Pan. Forest Queen, though only seven years old, has had six calves. The family are a very valuable one, and have a fair prospect before them of future fame.

There are also on the farm at Killerby several other females with three and four crosses of the best Booth bulls from cows of large roomy frame, of the Yorkshire breed, which came there to supply the house with milk after the dispersion of the herd in 1852. So great is the effect of a few crosses of good Booth bulls, and so large is the demand for their produce, that several of these have already become, and others promise to be, a considerable source of profit to their owners. But the pearl of pearls, the very *specie gregis*, remains to be mentioned last. It is a present to the Messrs. Booth at Killerby from their kind and generous relative at Warlaby, and one second to few even in Warlaby's distinguished herd. Descended from the Moss Rose family, and a daughter by Crown Prince of the ever memorable Vivandière, an own sister, therefore, of Prince Alfred, of imperial and royal fame, Soldier's Nurse is everything that might be expected, from her lineage, and gives promise of possessing the hereditary fertility. She has presented her new owners with a most promising young bull by Valasco, and with two heifers by Windsor; the first of these unfortunately died, but the second, Soldier's Dream, is indeed a vision of perfection, as near an approach to it as can be made. Soldier's Nurse was herself considered by many good judges, before she left Warlaby, to be superior to even Queen of the Vale; but Mr. Booth's practised eye saw the difference, and she must be contented to follow, though at no long interval, the unrivalled Queen. She is not quite so large, and rather darker in the red. She inherits from her mother an almost Bride Elect breast, is beautifully ribbed up, and, with faultless hair and touch, she is the very picture of a Shorthorn, and she and her graceful daughter deservedly stand A 1 and 2 in the present Killerby catalogue.

This is not the only instance of Mr. Booth's kindness to his nephews. They derive the bulls Prince George, Valasco, Knight Errant, and Lord Chamberlain from the same source, which, with Trojan Warrior (20,992), form the present staff of Killerby bulls.

Long may the house-tree of Killerby flourish
The shelter and grace of the Killerby line !
Ne'er may its lawns fail of pasture to nourish
Herds, ever famous, of Killerby kine !

THE WARLABY HERD.

We must now take a retrospect of the herd at Warlaby, commencing with the year 1835, when Mr. Richard Booth, inheriting the estate, went to reside there. Mr. Booth's residence at Warlaby is a modest, unassuming country-house. It stands environed by well-timbered paddocks in a rich meadowy tract of country bounded by distant hills, and known as the Vale of the Wiske. It is one mile from the village of Ainderby, of which it is a hamlet, and about three from Northallerton, the central town of the North-Riding. The farm consists of 310 acres, of which about half is pasture. The land is better in character than that at Killerby; it is chiefly clayey loam, and grows fine wheat and turnips, and long hay. The pastures are well adapted for cows, but unsuited for sheep, because liable to be flooded. The River Wiske, which still retains its Gaelic name, *Uisg* (water), being the most sluggish of all the North Yorkshire brooks, and having the shallowest stream channel, frequently over-flows the lower pastures, and large deep ditches, which have been fatal to many a good cow, intersect the fields to carry off the water.

The house is replete with every comfort that an old bachelor or his friends can require; and many a visitor there can bear testimony that within its walls still reigns supreme the open-hearted northern hospitality to an extent that Southrons know not. Many a valuable cup and hard-won medal may there be seen; the portrait of many a prize-taker decorates its rooms; and many a pleasant hour has been spent and ancient story told in that quiet Shorthorn home, while the genuine old Squire

Refilled his pipe, "and showed how fields were won."

Shortly after settling at Warlaby, Mr. Richard Booth had quite made up his mind to give up the breeding of Shorthorns, and had already sold individual animals from the Strawberry and Moss Rose tribes, when a bantering remark made by a gentleman in the neighbourhood, to the effect that the Booths had lost their Blood, incited him to change his purpose, and put his friend's assertion to the proof. The Warlaby herd had for some years past been kept very much in the shade, Mr. Thomas Booth having been latterly intent only on breeding useful animals, without aspiring to the honours, or courting the notoriety, of public exhibition; but Mr. Richard Booth felt assured that it contained ample materials to enable him to guard the laurels that had been bequeathed to him.

Amongst the cows then in the herd, and whose descendants have earned a wide-spread renown, were Strawberry 2nd by Young Alexander, and Rally by Rowton, both of the Halnaby or Strawberry tribe; Flora by Isaac, of the Farewell tribe; Blossom by Young Red Rover, and Young Red Rover himself, of the Blossom tribe; Broughton by Jerry, and her daughter Young Broughton by Young Matchem, of the Broughton tribe; Moss Rose by Priam, of the Dairymaid tribe; and Christian also by Priam, to the number of which Mr. R. Booth now added one of the best cows of her day, his own Isabella by Pilot, then sixteen years old.

This cow Isabella, which has already been spoken of in the account of the Studley herd, produced at Warlaby Isabella Matchem, by Young Matchem, who gave birth

to Fitz-Leonard by Leonard, Vanguard, Innocence, and Isabella Buckingham all by Buckingham, and Isabella Exquisite by Exquisite. Fitz-Leonard was a neat, moderate-sized bull, standing on very short legs. What higher merit can be ascribed to him than that he was the sire of Crown Prince? Vanguard was a noble bull, as all the Buckingham bulls were. He was seven years on hire at Mr. Torr's, who, in 1853, exhibited him at the North Lincolnshire Agricultural Show, where he obtained the first prize of £20 (open to all England), beating several famous prize animals. Innocence, a small, level cow, with a luxuriant coat of hair, died from hæmorrhage after calving. The flow of blood was stopped for nine days and then recommenced and could not be arrested. Her calf Leonidas by Leonard became a very fine bull, and was the sire of the notable Monk, one of the best of the Warlaby bulls. Leonidas's hair was so long that it waved about in the wind like the wool on a sheep's back. Isabella Buckingham was a superb cow of great substance. She weighed when slaughtered upwards of 100 stones, though she had been previously much reduced by the foot-and-mouth disease. She won seven prizes at the Royal, the Yorkshire, and the Highland shows, including two firsts and a second (to Charity) at the Royal meetings. Isabella Exquisite by Exquisite was a cow of only ordinary appearance.

Isabella Buckingham was also put to Exquisite; but the result of this cross, in the cow Sample, was equally unsatisfactory. She was a plain animal, with scarcely any of the Warlaby characteristics; nevertheless, her daughter, Isabella Hopewell by Hopewell, which was sold at the Killerby sale, under the name of Ecstasy, to Mr. Douglas, and is now the property of Lady Pigot, is a good cow, and a very good breeder. Another daughter of Sample's—Specimen by Crown Prince—was herself put to Crown Prince three times, and produced the prize cow Lady Grace and the bulls Sir Colin and the Corsair, in all of whom the Warlaby type is completely restored. Sir Colin was sold to Mr. McDougall of Australia, but unfortunately died in crossing the Line. Lady Grace took the first prize for the best cow in calf or milk at the Cleveland Agricultural Show at Yarm in 1861, and was thus referred to in the Report of the Show in your columns: "Mr. Booth's Lady Grace is a remarkable specimen, and a very fair specimen, of what a Shorthorn of Mr. Booth's blood really is, in its natural state. Although she has gone to grass with ordinary kine, and been fed as any ordinary cattle are and should be, she is nevertheless exceedingly fleshy, and displays all those various points of excellence, particularly about the shoulder and quarter bones, covered as they are with a rich coating of elastic meat, for which the Booth breed are distinguished." Lady Grace, a daughter and grand-daughter, as we have seen, of Crown Prince, was herself put to a son of Crown Prince—Prince Alfred—and the offspring, Graceful, is all that her name implies. She was one of the pair of heifers that took the first prize at the Worcester Royal, where she unfortunately cast twin calves. Lady Grace and her daughter Graceful, *malgré* their in-and-in breeding, show every indication of the most robust constitution and have abundance of hair. The former has been out with a lot of others day and night through three winters, even when the pastures were a waste of snow, without any shelter but the leafless hedges or "the inclement drift."

Whilst entirely concurring with Mr. Booth in the opinion that, as a rule, family alliances have been followed by more favourable results in the Warlaby herd than the resort to extraneous blood, we yet think it has been too much the fashion amongst "Booth men" to form conclusions unfavourable to such bulls as Exquisite, Water King, and Lord Stanley, from the acknowledged shortcomings of their *immediate* offspring. It is usual, for

instance, to cry down Exquisite, and to say that the use of him was unsatisfactory. It undoubtedly was so, in the first instance, in more cases than those above mentioned; and why? Because the Booths deviated from their usual course, and at one stroke introduced *too much fresh blood*. They had previously introduced the fresh blood of Mussulman, but in a modified form, through Buckingham, and that of Lord-Lieutenant in an equally modified form through Leonard; but they infused the blood of Exquisite into the herd raw and undiluted. The result might have been foreseen.

But the question really is, not what was the immediate consequence of this over-powering dose of fresh blood? but, what were the results when the Exquisite blood became gradually more incorporated with the Booth in the same manner and with the same modification as that of Mussulman and Lord-Lieutenant?

Your own admirable description, sir, of Lady Grace is a sufficient answer. Nor are there wanting other examples than those of Lady Grace and her blooming daughter to prove that the blood of Exquisite has done no more harm to the Booth cattle than did the blood of Mussulman when they have it in their veins in an equally diluted form. Not to mention others—British Hope, purchased by the late Mr. Langston at Lady Pigot's sale, was, in the opinion of good judges, the best *Booth* bull sold there; he was by British Prince from Isabella Hopewell, a granddaughter of Exquisite, and a cow which had previously bred, by a bull partially Booth and of a Booth family, Lamp of Lothian.

Nothing could be more respectable than Exquisite's lineage, combining as he did the best of the Chilton and Wiseton blood; and we are certainly justified in imagining that, as an animal, he must have been first-rate, or three such unquestionable judges as the late Mr. Booth, Mr. Richard Booth, and Mr. Torr would hardly have given 370 guineas for him at the Wiseton sale at thirteen months old, the highest price then on record of any animal sold by public auction. Exquisite had plenty of substance, and a profusion of beautiful hair, a characteristic which may often be observed in his descendants.

In further illustration of our argument, we may here refer to the fruit of the union between Mr. John Booth's world-renowned cow Bracelet and Col. Cradock's Mussulman—the bull Buckingham, whose name and fame will endure as long as shorthorns exist. To superficial observers, Buckingham was, as is well known, a plain, ungainly animal, the result of the first cross with Mussulman being apparently exactly the same as the first cross with Exquisite. In the hands of a less discerning judge, Buckingham would probably have been steered; but his owner's practised eye, accustomed to weigh the relative values of points and proportions, and to detect latent capabilities in animals bovine and equine, saw beneath Buckingham's plain exterior his high qualifications for a sire.

Mr. Richard Booth showed an equal appreciation of the merits of this bull, and determined to secure him for his own herd. An entry in the margin of the late Mr. Booth's herd-book records the fact that he "sold Buckingham to his brother Richard for £150." It remained for the Future to demonstrate the wisdom of this purchase. No visitor to Warlabby could ever appreciate the merit of this bull until his offspring proclaimed it. Never were calves with backs so broad, ribs so round, shoulders so shapely, flanks and fore-quarters so full and deep. Buckingham's career at Warlabby was unfortunately brief. Two distinguished breeders from the Emerald Isle, Mr. Chaloner and Mr. Barnes of Westland, arrived at Warlabby in quest of a bull. After viewing the herd with Mr. Booth, they retired to prepare for dinner, when Mr. Barnes remarked

to his friend, "We must hire Buckingham." "You cannot be serious," replied Mr. Chaloner, "in proposing to hire such an ugly brute!" "Look at his stock," said Mr. Barnes. "If you hire him, you must hire him alone," rejoined Mr. Chaloner, for I tell you candidly I cannot join you." "I will," said Mr. Barnes; and he did so. The tragical issue of this hiring—how the luckless Buckingham was destined to reach the shores of Erin only in strong whiffs of roast beef, and with what characteristic devotion his Irish conductor shared the poor animal's funeral pyre on the burning deck of that ill-fated bark, rather than desert his charge, are matters of history already chronicled by abler pens than ours. The loss of this bull was a national one, as an enumeration of some of the animals he bequeathed to Mr. Booth will show: Charity, Plum Blossom, Bloom, Bagatelle, Bonnet, Medora, Vivandière, Isabella Buckingham, Vanguard, Hopewell, Benedict, Baron Warlabby—all not only famous in themselves, but the parents of animals whose names are as familiar in our ear as household words.

Moss Rose by Priam, one of the cows, which came into Mr. R. Booth's possession in 1835, was the grandam of Minette by Leonard, and of Mr. Mason Hopper's prize bull Master Belleville, the grandsire of Lady Pigot's Rosedale and of Mr. Storer's Paterfamilias. Minette was the dam of Vivandière and Royal Buck, both by Buckingham. Amidst the galaxy of prize beauties hereafter to be mentioned, the modest Vivandière, with her beautiful head, was frequently unobserved, except by the admirers of a well-filled udder, unless brought into notice by a quiet observation from her owner of, "Look at that head and hair!" She has, however, amply vindicated Mr. Booth's judgment, and her own claim to something more than a passing notice. She has had ten calves. One of her sons, Prince Alfred, was a very stylish bull, with just the mould and hair to ensure his success in the show-field. He was only exhibited once, however—at Berwick-on-Tweed, where he won the first prize as the best bull-calf.

"For other fortune then he did inquire,
And, leaving home, to Royal Grange he sought,
Where he did let himself for yearly hire,
And in the Prince's service daily wrought."

In other words, Prince Alfred had the honour of serving two years in the late Prince Consort's herd at Windsor, and one year in the Imperial model farm at Fougues; after which he had the further distinction of spending two years on the farm of that Queen of English Bucoles, Lady Pigot, who, like her sprightly and bewitchingly-entertaining exemplar Lady Wortley Montague, seeks repose from the occupations of the gay world in pastoral and agricultural pursuits.

Vivandière produced, besides Prince Alfred, Welcome by Water King, Vivacity by Fitz-Leonard, Verity by Vanguard, and Campfollower and Soldier's Nurse, both by Crown Prince; and also Prince Arthur and Prince Oscar by Crown Prince, and Knight Errant by Sir Samuel.

Water King, the sire of Welcome, was by Baron Warlabby, his dam by the 4th Duke of Northumberland, g. d. Waterloo 3rd by Norfolk, g. g. d. by Waterloo, g. g. d. by Waterloo. He was put to a few other animals in the herd, but the cross not being thought to have amalgamated well with the Booth blood, except in the case of Peach Blossom and Water Nymph, his use was discontinued. Welcome, however, it must be admitted, furnishes another illustration of our argument that, though the fruits of Mr. Booth's recent experiments in crossing have not as yet been such as to encourage him to depart from his usual course of adhering to proved blood, it is hardly fair to jump to the conclusion that these crosses have been injurious, or even unproductive of good, because their immediate results have been unsatisfactory. Welcome, it is true, is a homely enough cow herself; in fact, one of

the old-fashioned, unimproved type; but she has given birth to a heifer, Welcome Hope by Hopewell, little inferior in style and merit to any animal in the herd. "Ye ken," quoth old Cuddy, "some folks say we sud gang for a change o' bull. Ye see we did gang in ould Welcome. Whya, she be a vara useful cow, and mony a yan has nae sac gude a yau; but is she to be mentioned i' t' same day as Campfollower? Nout o' t' kind; she munnot be i' t' same year. See ye at Campfollower, doesn't she walk away frae ye like a Queen?" "But her daughter, Welcome Hope," we remark, "is a good animal." "Aye! Hopewell has putten in some gude wark when he gat that there heifer. She wad mak' up a slashin' cow, though she *have* a lile touch o' Bates bluid in her; but then, ye ken, ould Hopewell wad mak' up a' deficiencies."

Vivacity by Fitz-Leonard, another daughter of Vivandière's, was sold by Mr. R. Booth to Mr. Bolden, together with Young Rachel, the dam of Mr. Ambler's Grand Turk, Bridget by Baron Warlaby, and another. They were purchased by Mr. S. E. Bolden, for his brother in Australia, just at the time the gold discovery caused a rush of emigrants to that country, and it was found impossible to ship them at anything like reasonable rates. Mr. Bolden informed Mr. Booth of this, and offered to return the heifers; but Mr. Booth gave him the option of retaining them himself, which he was glad to do. Vivacity was a strikingly beautiful heifer, but unfortunately died in giving birth to her first calf, May Duke by Grand Duke; which was sold to Mr. Carr, and resold by him to the Hon. Noel Hill; in whose herd, and that of Mr. Robinson of Clifton Pastures, whose property he subsequently became, he did valuable service.

Verity by Vanguard was the grandam of Sincerity, who stood second to Queen of the Ocean at Guisboro', and was one of the six animals that won the silver cup at Skipton. Her dam Truth, died three weeks after calving, and Sincerity was brought up amongst the calves of the nurse cows, skimmed milk and porridge being "the best of her diet." She was calved in January 1859, and through the winters of 1860 and 1861 she never had a roof over her head. During the first winter, Bridal Wreath, Dora, and Blush were her companions; and through the next, Rosette and Princess Elizabeth shared with these four the rigours of an unusually severe season. Sincerity was taken up just before calving in 1862, and after producing twins it was determined to "put her in training," as the slang phrase goes, for the show-yard. After her successes in the North, it was decided to enter her for the Worcester Royal Show, but she unfortunately displaced the patella of the stifle-joint, and she has been slaughtered. Sincerity had much of the character of Nectarine Blossom; perhaps was even more cylindrical in her proportions. Her fore-ribs were as round as a barrel.

Vivandière's daughter, Campfollower by Crown Prince, is a truly noble cow, with a queenly form and gait. She has capital crops, a broad, flat back, and is very wide between the legs. When she and Lady Grace were heifers together, it was difficult to determine the point of superiority between them. She is the dam of Soldier's Bride by Windsor, General Hopewell by Hopewell, and Soldier's Joy by Lord of the Valley.

Soldier's Bride, with her broad, deeply-covered back and circular frame, her wonderfully expansive shoulders, girth, and bosom, is too well-known to require any description here; suffice it to say, that a slight droop of the hind-quarters forms

"The sole alloy of her most lovely mould."

At the Royal Agricultural Meeting at Worcester in 1863, she shared with Queen of the Ocean the honour of the first prize for the best pair of cows, and has won nine

other prizes at the principal shows. When she was exhibited as a yearling at the Northern Counties Show at Darlington, where she won the Founder's cup as the best animal in the yard, her estimated dead-weight, she being then only one year and eleven months old, was 70 stones—an instance of early maturity of which there is no parallel on record. Soldier's Bride's half-sister Soldier's Joy is what Cuddy calls "a modelsome sort of a beast, a gude red, gude in her ribs, and lets weel down in her breast." She is the image of her sire Lord of the Valley. Her half-brother General Hopewell is one of the neatest and best-framed bulls we have ever seen at Warlaby.

Soldier's Nurse, Vivandière's fourth daughter, has already been descanted upon in the account of the Killerby herd, in which she bears the bell.

Flora by Isaac, of the tribe then known as "the Hope tribe," but since distinguished as "the Farewell," was another of the cows which Mr. Booth inherited with his paternal fields. She was the dam of Farewell by Young Matchem, from whom came in successive generations the ever memorable cows Faith by Raspberry, Hope by Leonard, and Charity by Buckingham, besides Harbinger, Hopewell, and the most famous bull of recent times—Crown Prince. Faith was a large, fine, but rather masculine cow. She stood second to Necklace at Doncaster in 1843, and second at Richmond in 1844. Her daughter Hope by Leonard was a magnificent cow, some even venturing to affirm, better than Charity. She won five first prizes.

Of Charity, who so long graced the Warlaby pastures, it is sufficient to say that she was the personification of all that is beautiful in Shorthorn shape. Such was her regularity of form, that a straight wand laid along her side longitudinally, from the lower flank to the fore arm, and from the hips to the upper part of the shoulder blades, touched at almost every point; her quarters were so broad, her crops and shoulders so full, her ribs so boldly projected, and the space between them and the well-cushioned hips so arched over with flesh as to form a continuous line. It was difficult for the most hypercritical eye to detect a failing point in this perfectly-moulded animal, and it was in consequence of Mr. Booth's high appreciation of her merits and those of her son that he made such free use of Crown Prince. Charity won every prize for which she was shown save one, when she was beaten as a calf by another of the same herd, after which her career was one of unvaried success. She was thrice decked with the white rosette at the Royal and thrice at the Yorkshire meetings.

Hope's son, Harbinger, by Baron Warlaby, with the exception of a little too much prominency of hip, was a very first-rate bull. He was let for a higher rent than any previous bull had been—250 guineas a-year. He was the sire of Mr. Booth's prize cow Bridesmaid, and of Red Rose, the dam of the incomparable Queens. Harbinger won the first prize in the bull-calf class at the Royal at Exeter in 1850, the only time he was shown.

Hopewell, another son of Hope's, and by Buckingham, was a fine lengthy bull, with a grand head and crest and remarkably soft well-covered hips. He was exhibited at the Royal at Norwich in 1849, and, with the whole class in which he stood, was condemned as not worthy of a prize. At the Yorkshire show at Leeds the same year he was first in his class, and subsequently made nearly £1,000 in hire.

Charity's world-renowned son, Crown Prince, needs no panegyric here. To the visitor to Warlaby's would say: "Si monumentum queris, circumspice." Nor are the memorials of his achievements confined to Warlaby: they may be traced in a hundred herds to which his sons have transmitted the virtues of their sire.

Crown Prince was never exhibited; but Mr. Booth truly says of him that "though he was not a prize-winner he was a prize-getter," an assertion which the records of almost every important showfield in the kingdom will verify. At one time Mr. Booth had sixteen bulls by him, let at once, at from 100 to 250 guineas each (his total number out at hire being then 26). He refused to let him for 300 guineas to a Yorkshire breeder, and he also refused an offer of 100 guineas to send four heifers to him, and to take a bull into the bargain.

Fame—a sister of Faith—which was sold to Mr. Walker of Maunby, produced Fanchette by Petrarch, Fay by Foigh-a-Ballagh, and Florence by 2nd Duke of York. From Fanchette are descended Mr. Torr's Fairmaid by Usurer, Mr. Pawlett's Fairy by The Corsair, and Mr. Barclay's Faith, by Sir Charles. Four of this family, two cows and two heifers, were sold at Mr. Sanday's sale in 1861 for the large sum of 675 guineas. Fay produced Mr. Bolden's Fenellas by Grand Duke; and Florence was the dam of that gentleman's Dukes of Bolton by Grand Duke, and Little Red Rose by Petrarch. The latter, which was sold by Mr. Bolden to Mr. Douglas, was the dam of Norma, who has, in the hands of Mr. Wood of Castle Grove, given rise to a numerous and most valuable family, one of which is Mr. Wood's splendid cow Coquette, whose daughters, Mr. Douglas's Clarionette, and Castanet, lately the property of Lady Pigot, have not been without renown in English showfields.

Farewell, after giving birth to the above produce at Warlaby, was sold by Mr. Booth to Mr. Walker, of Maunby. It seems singular that Mr. Booth should have parted with so very valuable a cow; but probably he did not then anticipate the world-wide fame which awaited her descendants. In Mr. Walker's hands she gave birth to several calves; but two only of these have maintained the family. These were her twin-daughters Clementina and Clematis by Clementi (3899). The well-known prize-bull Clementi was bred by Mr. Parkinson, and, like his own and equally celebrated brother Collard, was half-Booth, being a son of Mr. Booth's Cossack (1880), from Mr. Shafto's famous cow Cassandra by Miracle. Of his twin-daughters from Farewell, Clementina and her descendants were unfortunately crossed with other blood, but have produced valuable animals in the herds of Mr. Foljambe of Osberton and Mr. Lynn of Stroxtou.

Fortunately, Farewell's other twin-daughter, Clematis, met with a better fate; and her descendants by Booth bulls continue the royal line. We say fortunately; for, alas! the Farewell family are extinct in the female line at Warlaby; and if it were not for Clematis and her descendants, we should look in vain for pure Booth animals which trace their origin to Farewell. While yet at Mr. Walker's, Clematis gave birth to Baroness by Baron Warlaby; and Baroness, after passing through the hands of Mr. Harvey Combe, became, while the property of Mr. Crawley, the dam of Barmaid by British Prince. Barmaid, now the property of Mr. Storer of Helliidon, is a large, massive cow, of great size, substance, and constitution, whose only faults are, that her hips partake somewhat of the same tendency which distinguished her relation Harbinger, and that she has something of the inasculine character which was observed in Faith. She has been the dam of Mr. Naylor's King Oberon, by Elfin King; of Windsor Prince, by Don Windsor, sold to Sweden; and of a neat, pretty heifer, Dame Quickly, by Valasco, one of the Stackhouse herd. Barmaid is pure Booth, with the exception of a remote half-cross, which causes one-sixteenth of her blood to be that of the famous cow Cassandra. Her daughter Dame Quickly is all Booth, save one-thirty-second part. So that this family may fairly claim the first place as representatives of that noble line which no longer perpetuates itself at Warlaby.

The Strawberry or Hainaby tribe next claims our attention. We have seen that on Mr. Richard Booth's accession to the herd in 1835, it contained two cows of this family, Strawberry 2nd by Young Alexander, and Rally by Rowton.

Third in descent from Rally came Young Rachel, by Leonard, previously mentioned as one of the four sold to Mr. Bolden. She gave birth while at Springfield to the lordly Grand Turk by Grand Duke, afterwards the pride and glory of Mr. Dodds and the Watkinson Hall herd.

Strawberry 2nd by Young Alexander, dam Strawberry by Pilot, granddam Strawberry by the Lame Bull, was the dam of the famous cow White Strawberry by Rockingham: Rockingham's dam was Strawberry by Julius Cæsar, half-sister to Strawberry 2nd by Young Alexander, both being from Strawberry by Pilot; and Julius Cæsar was by Young Albion: Rockingham's sire was Isaac, and Isaac was a son of Isabella by Pilot, and of Young Albion, who was by Albion out of Strawberry by the Lame Bull. This cow, White Strawberry, bred, as we see, from the closest affinities of blood, was a magnificent, broad-backed, wide-breasted animal, quite equal in merit to Anna and Isabella by Pilot, the two best cows that any of the three herds had previously to 1835 produced.

White Strawberry was the dam of Leonard by Lord Lieutenant, and the ancestress of that branch of the Hainabys that produced Monica by Raspberry, and her offspring Prince George by Crown Prince, Monk by Leonidas, and Modesty, Medora, and British Queen by Buckingham. Monk, a magnificent bull, was absent from Warlaby on hire for ten years, and Prince George for nearly as long. Modesty, though the twin sister of the handsome Medora, was not much in herself to boast of, unless the old adage be applied to her of "Handsome is that handsome does." She has had twelve calves, amongst which were the well-known animals Water-nymph, Chastity, and Majestic. Water-nymph did not breed, and was fed off. Though entirely grass-fed, never having been in the house summer or winter, she won the first prize as the best fat heifer at the Yorkshire show in 1856. Chastity, but for the one failing of a rather upright shoulder, was a very superior cow of true proportions. She was the dam of Sir Roger by Windsor. She was drowned in the Wiske owing to the ice on which she had ventured giving way. Modesty's two last calves have been heifers by Lord of the Valley: the elder one, Maiden's Blush, is a full-haired, short-legged, deep-breasted yearling, though she has had, as Cuddy says, "nobbat a poorish putting on."

Modesty's twin sister Medora was a very stylish heifer, of great promise, which she did not live to fulfil; for

"She, to give the herd increase,
Forfeited her own life's lease,"

and died after giving birth to her first calf, Red Rose by Harbinger.

No cow ever trod the Warlaby pastures with a more becoming grace than Red Rose. With the exception that her hips were what the French would call a little too *prononcée*, a failing to which Harbinger's stock were rather prone, she was the perfection of proportion. The Rev. Mr. Bolden, perhaps the best judge of Short-horns in the county of Lancaster, offered for her, when a heifer, a blank cheque to be filled up by Mr. Booth with any amount he thought proper. Though Red Rose has never aspired to personal distinction, she has not gone without her fame, having given birth to the peerless Queens, Queen of the May, Queen Mab, Queen of the Vale, and Queen of the Ocean, all by Crown Prince—four sisters more remarkable than any one cow has ever before produced—and also Lord of the Valley by Crown Prince (the sire of almost all the young stock now at Warlaby),

Lord of the Hills, Ravenspur, and another young bull by Sir Samuel; and though this pride of the parterre has now somewhat shed her bloom, she has not yet fallen into the yellow leaf, and Cuddy has good hopes of another Red Rosebud from her ere the summer wanes.

It is a fact curiously at variance with the usually deleterious consequence of the forcing system upon fertility, that the four heifers bred by Red Rose, which have all been more or less forced for the show-field, have all proved breeders, whilst of seven heifers produced by Modesty, which, like their dam, have all been reared as the common stock of the farm, only one, Chastity, has as yet bred.

The visitor to Warlaby in Feb., 1855, might have seen five white heifers, more choice and excellent than the milk-white steers offered of old to the Celestial Gods—not grazing, for they were up to the knees in snow, but regaling themselves as best they might on hay and turnips, and all preparing for sacrifice. There were Water Nymph and Melody, daughters of Modesty; Butterfly and Benevolence, both from Bagatelle; and Hahnaby the 3rd, from Hahnaby, sister of White Strawberry. They were all of a rich creamy white, with yellow waxy horns, and from exposure to all weathers their hair was of the thickest and most. Though fed solely on grass, hay, and turnips, some of them weighed from 80 to 84 stones of 14lbs. to the stone.

But we must here devote some space to the description of the four royal daughters of Red Rose, and first a word as to their names. To judge from the ludicrously unmeaning and inelegant appellations which offend one's eye on almost every page of the Herd Book, few people would appear sufficiently to appreciate the importance of a good name, which, to be good, should be either appropriate and euphonious in itself, or suggestive of pleasant associations. Nothing can be more graceful than such titles as Queen of the May, Queen Mab, Queens of the Vale, of the Ocean, and the Forest, Lord of the Hills, Mountain Chief, &c. The very mention of them calls up visions of beauty; the month of Love, with all its flowers; the Fairy Queen, with all her elves, tripping o'er hill and dale, forest and mead,

“Or on the beachèd margent of the sea.”

It is impossible for a man to be *prosy* in writing of the possessors of such romantic titles. We are ever and anon, it will be observed, irresistibly borne away on sudden gusts of poetry.

Queen of the May was in almost every respect a model of what a Shorthorn cow should be. Her loins and chine were very wide, flat, and deeply fleshed; her quarters long and level; her head sweet and feminine; her shoulders, girth, and bosom magnificent. Her only failing point was a want of fulness in the thighs, proportionate to the even massiveness of development displayed everywhere else. During her short career—for she was permanently injured in a railway journey, being then for the first time in calf—she won six prizes at the Royal, the Yorkshire, and the county of Durham shows, being awarded at one of the latter the 100-guinea challenge cup in 1857.

It has been reported that Mr. Booth refused for Queen of the May an offer of 1,500 guineas, the highest price ever bidden for a Shorthorn. The circumstances—which are given on Mr. Booth's authority—are these: Two gentlemen from America, apparently agents for an American company, came to see the herd, and when they saw Queen of the May were completely riveted by the fascination of her beauty. After fondly dwelling for some time upon her perfections, they inquired of Mr. Booth whether he would part with her. He replied that he “would not sell her for the highest price ever given for a

Shorthorn.” “That, sir,” said one of them, “was, I believe, 1,200 guineas?” Mr. Booth answered in the affirmative. They consulted together, and asked him whether he would take 1,500 guineas, which Mr. Booth declined to do, remarking that if she bred a living calf, and he had the luck to rear it, she was worth more to him to keep, and they relinquished her with regret, leaving on Mr. Booth's mind the impression that, if he had entertained the idea, even that large amount might possibly not have been their final offer.

Of Queen Mab and Queen of the Vale we can write no better description than one we furnished to the Highland Agricultural Society's Journal after the Perth show in 1861, when Queen of the Vale was first in the cow class, and Queen Mab second. “Queen of the Vale is a cow of faultless proportions, a perfect parallelogram in form, with well-fleshed, obliquely laid shoulders, a good head, and very sweet neck and bosom, sweeping finely into the shoulders, the points of which are completely hidden by the full neck-vein. Queen Mab is, if possible, still more remarkable than her sister for her broad, thick, level loins, depth of twist, and *armful* of flank; but she is now perhaps less faultless, as her hind-quarters are becoming plain, and patchy from fat. She is, however, equal, if not superior, to Queen of the Vale in her marvellous capacity of girth, fore rib, and bosom. Like her sister, she maintains her cylindrical proportions wonderfully throughout, the ribs retaining their circular form up to the shoulders, with which they blend without any depression either at the crops or behind the elbow, and from thence the fore-quarters taper beautifully to the head.” Cuddy finds Queen of the Vale “a bothersome jade to tak the road wi’.” She be of an uneasy turn, the cratur! When she's of she's floutered; she winna tak her meat, fond wean! She lukes ollas best at hame; sartainly she's a grand cow; see at her length. I dinna ken whether on 'em I sud choose: Queen Mab's t' grander colour, but then Queen o' t' Vale walks wi' sic an air! There be ya thing—yan could na be far wrang whichever on 'em yan tuke;” an opinion in which the visitor will agree with Cuddy.

“Yours is, he said, the nobler hue,
And yours the statelier mien;
And, till a third surpasses you,
Let each be deemed a Queen.”

Queen Mab was the winner of twelve prizes at the principal shows, amongst them the Durham County hundred-guinea challenge cup in 1859, which had been won the previous year by Nectarine Blossom, and which having been also won by Queen of the May in 1857, as we have previously seen, now became the property of Mr. Booth, and an heirloom of the House of Warlaby. Queen of the Vale was the winner of nine prizes.

It may be worthy of mention that when Queen of the Vale was shown as a yearling at the Royal exhibition at Warwick, she obtained no notice whatever from the judges. She had not gone through the all-essential “training!”

Sister to Windsor, one of the best of the Warlaby herd, and which had shortly before been pronounced by an eminent Shorthorn breeder to be perhaps the most perfect model of Shorthorn conformation in the kingdom, was shown, together with Chastity, fresh from the pasture, and they were both unnoticed. Happening to be at Warlaby a fortnight before the Warwick meeting, Mr. Booth showed us these cows in the pasture, pointing with pride to the extraordinary depth and firmness of the flesh on their backs and ribs, which being the product of natural food, naturally acquired by grazing, was just what a butcher likes—“solid,” as Mr. Booth expressed it, “as a well-stuffed wool-pack.” They were destined for Warwick.

“Oh! that this too too solid flesh would melt—
Thought we—melt into oleaginous blubber, The cows had

no "quality." They were signal examples of what animals of unfashionably robust constitutions are brought to by pasture grass, open air, and exercise. The lean flesh was evidently in excess of the fat; and the fat was evidently blended with the lean, instead of being all outside of it. Moreover, the fat was not of that nice soft unctuous nature which is acquired by close confinement and liberal supplies of new milk, linseed-cake, and linseed-oil, but of the firm waxy consistence, so unpleasant in venison. We felt convinced that cows in this untrained condition had no chance of favourable recognition in the show-field, and ventured to express this conviction to Mr. Booth—a conviction which was afterwards fully realized. There are those who contend that agricultural associations, professedly formed for the improvement of animals designed for the food of man, and the encouragement of tenant farmers to vie with their richer rivals in effecting this improvement, ought not to discountenance the natural and inexpensive system of feeding which induces a healthy and vigorous development of flesh, and encourage the artificial mode which results in a diminution of flesh, and that substitution of flabby fat to which some attach the name of "quality"; but these people appear to look at the matter in a vulgarly utilitarian point of view.

Few people are aware, sir, what this "quality" represents. It represents the liberality of the owner, the lavish expenditure of costly food upon the animal that possesses it, the overflowing pails of new milk, the superabundant supplies of cake, corn, and condiment, and the luxurious repose and warm housing and clothing it has enjoyed. Some of your readers will add—"it also denotes the torpor and derangement of all the animal functions which result from this liberality and indulgence—this eating of the bread of idleness in the lap of luxury." Be it so: Nature, in default of other outlets for this excess of nutrition, deposits it—we care not whether by an unnatural and morbid process or not—in the shape of fat, where it "communicates a pleasurable and delightful sensation" to judicial fingers, and valuable parings for the tallow-tub. Once do away with this "quality" test, disqualify animals with soft, or what some call flabby, handling, and you abolish the *forcing* system. For if *firm* substance were insisted on, it would be necessary to develop lean flesh, or in other words, muscle; and, to do this, the animal would require to have constant exercise, and therefore to be what *Nature* doubtless designed a beef-growing animal to be, a *grazing* animal. Under such conditions it would no longer be those animals that had cost the most money to rear and feed that would take the prizes; but such as had the greatest *natural aptitude* and capacity for healthy and ample development: the triumph of skill, which consists in "training" animals destitute of any natural disposition to acquire flesh, and in filling out their points and covering their defects by the long-continued use of rich and costly food, would fail of its reward. Then, sir, the Royal Agricultural arena would lose much influential patronage. It would be thrown open to all sorts and conditions of men. We should have farmers and men of moderate means competing with men of affluence! We should have horrid butchers speaking approvingly of a "carcase" as being "hard fat," being "grandly marbled," and "prime flavoured;" and telling us that such like could never be too fat, for that every ounce of them would sell "at top prices like a pound o' butter!" What would become of the artistic and artificial graces of Shorthorn breeding? Once admit that beauty in a Shorthorn, like beauty in architecture and in many a work of art, should be the handmaid of practical utility, and perchance the pampered herds of Cressus may display their meretricious charms became obdurate and hostile judges—

"May we lie low before that dreadful day,
Press'd with a load of monumental clay."

Thanks to the discrimination of our judges, a "wealthy" heifer has hitherto implied as its counterpart a wealthy owner; an animal of "quality" and substance, a man of quality and substance; a well-lined hide, a well-lined purse; a quadruped rolling in fat, a biped rolling in riches; in short, it has hitherto been a matter of necessity that he "who feeds fat oxen should himself be fat." It is this, sir, that has maintained the exclusive and gentlemanlike character of these yearly contests; but from the moment that we disqualify "quality," we admit "the vulgar herd" in a double sense. Nor would the mischief stop here; foreigners would buy prize animals whose constitutions had not been undermined; they would have calves from them, and consequently in time become independent of us! No, sir, let soft touch ever continue to be the touchstone of merit, and all these evils will be averted.

But to return from this digression. Queen of the Ocean is a superb Shorthorn—a queen of cows, a cow for England's queen. She is described in the Report of the Battersea Meeting, in the R.A.S.'s Journal, as "a short-legged, well-framed, useful animal, and by far the best female in the yard, with shoulders and houghs as near perfection as possible." "I think for sure," says Cuddy, "she muu be Queen o' t' World. Folks in general didn't think sae mickle about her; but our maister thout the the maier, but said nout, and she *hes* come out a clipper! Mr. Wetherell says there niver wor sic a yan, and *he* kens." At the Royal Agricultural Society's Meeting at Battersea, in 1862, she won the first prize and gold medal in the cow class, and at the County of Durham Show, in the same year, the hundred-guinea cup. At the Royal Society's Meeting at Worcester, in 1863, she gained the first prize jointly with Soldier's Bride for the best pair of cows. At this meeting the whole of the five entries from Warlaby (four of which were pairs) were prize takers. Queen of the Ocean was not forced for show until the February before the Battersea Meeting: but ran out at pasture with the other milk cows. She has gained, in all, ten prizes. Her young bull Prince of Battersea, though only a yearling, has already won splendid credentials—no less than seven first prizes. Mr. Booth has refused an offer of 800 guineas for him, and 800 guineas for his yearly rent.

Queen of the May the 2nd, the daughter of Queen of the Vale, by Sir Samuel or Windsor, next claims the tribute of our admiration as a nonpareil of beauty. She is a heifer of faultless symmetry—

"Thou hast no faults, or I no faults can spy:
Thou art all beauty, or all blindness I."

She is at present in great bloom. As Cuddy remarks, "She hands hersel weel together this winter, and lukes for iver better than she did i' t' summer;" and if she fulfils her present promise, it will take something very extraordinary to surpass her should she cross the Tyne. She has gained no less than fourteen prizes, including a first and second at the Royal Shows at Battersea and Worcester. She is believed to be safe in calf.

Another branch of the Halnabys springs from the Sister of White Strawberry—Strawberry 3rd, by Young Matchem, himself of the Halnaby family. From her is descended Bagatelle by Buckingham, which was a fine large cow, very wide in the floor of the chest, and with capital thighs, back, and loins. Her only weak point was a rather too upright shoulder; she was not however quite so elegant in form as Isabella Buckingham, to whom she stood second at the Exeter Royal in 1860, and at the Leeds Yorkshire Show in 1849. Bagatelle produced five calves: White Knight, presented to Mr. John Booth; Warrior, sold to go to America; Butterfly and Benevolence, already mentioned; and Bianca by

Leonard. Bianca gave birth to Bridesmaid by Harbinger, Bride Elect by Vauguard, and Prince of Warlaby by Crown Prince, a bull which in Mr. Booth's opinion possesses more of the character of Crown Prince than any bull he has bred. Prince of Warlaby has been for many years on hire in Ireland, where he has been the sire of innumerable prize animals. The cow Bridesmaid, of which an admirable portrait hangs over the sideboard at Warlaby, was an animal of deep, circular, and beautifully symmetrical frame, with a wide-spread back and loin, long well-filled quarters, and magnificent bosom. She won nine prizes, including one second and two first prizes at the Royal Meetings at Lewes, Gloucester, and Carlisle.

Bride Elect, now eleven years old, was remarkable for the extraordinary development of her fore-quarters, and particularly of her breast, whose depth and massiveness so far exceeded that of any Shorthorn hitherto known, as to have passed into a proverb. She was in all other respects an excellent animal, with beautiful head and horns, and admirable quality of flesh; but we shall call upon Cuddy again, to describe his old favourite; for we have almost exhausted our descriptive powers; and, indeed, when you have once done justice to the points and proportions of a single average Warlaby Shorthorn, it is but as a twice-told tale to describe others of the sisterhood; for it is the peculiarity of these tribes, and their distinguishing merit, that they are all cast in the same mould. With shades of difference and gradations of excellence that suffice for the charm of variety, their conformity in all important points to one standard is so remarkable, that it may be truly said of them *ab una disce omnes*. "Aye! you's poor ould Bride Elect. Did ter iver see sic au a breast and sic leeght timbers? Why a piece back a young gentleman were here, and he clapped hissel doon on his knees, and spanned her legs wi' t' fingers o' ya hand, and he wannut a big chap. Yan wad wonder how sic lile bane could hug sae mickle beef. She may be a bit faulty on her top, but she binna slack-backed, nobbut raytherlings, if out, too sharp i' t' chine, forrad; but look at her rumps and thighs, and loins, and aboon au, that breast. Why, there be amast plenty for twa beasts, and she has bred sae weel! She's a vara lovin' beast, and sic a coat. Poor ould cratur! our maister's vara

partial to a' t' sort on 'em." Bride Elect was the winner of six prizes. Her calves were three heifers—Royal Bride and Bridal Wreath by Crown Prince, and Bridal Robe by Lord of the Valley; and two bulls—Royal Bride-man by Crown Prince, and a roan bull by Lord of the Valley. The former was found hanged at his stake on the eve of starting for his first year's service. He had been let for 200 guineas a year. Royal Bride was a beautiful heifer, with all the substance and shapeliness of her dam. She unfortunately took cold, which brought on inflammation in the feet, from which she never recovered. She left behind her one daughter, Royal Bridesmaid by Prince Alfred, a lovely white heifer, with her grandam's massive bosom and girth, and which has lately calved a roan bull calf by Lord of the Valley. Bridal Wreath, a beautiful young cow, of a rich creamy white colour, also inherits her dam's fine ribs and deep capacious fore-quarters, and is what Cuddy calls "a rare cloggy beast." There are good judges who consider her the best cow for breeding purposes now in the Warlaby herd, though she had never been under the shelter of a roof until she gave birth to British Flag by Lord of the Valley, now serving at Messrs. Barnes and Chaloner's. She has since bred another very promising roan bull calf by the same sire. Bridal Robe, the third daughter of Bride Elect, is a nice shapely heifer, and of that rich purple and primrose colour so pleasing to the eye. She produced, when only 17 months' old, a dead bull calf, the result of an indiscretion with her scape-grace of a nephew British Flag, in whose society she had been trusted too long. In spite of this little *contretemps* she is a well-grown heifer.

I am, sir, your obedient servant,

WILLIAM CARR.

P.S.—In the last chapter of "The Warlaby herd" two errors occurred: Firstly, it was not Sir Colin, but the Corsair that was sold to Mr. McDougall, of Australia. Secondly, it was not Mr. Chaloner that accompanied Mr. Barnes to Warlaby to hire Buckingham, but another friend and countryman of his, whose name I had correctly given in the first instance, but altered in deference to a higher authority than the one from whom I had the anecdote, but whose recollection appears to have been at fault.

A SIMPLE PLAN FOR THE COLLECTION OF AGRICULTURAL STATISTICS.

Agricultural statistics are yet amongst the unattained objects of those who sincerely work to promote the welfare of the country. It is not desirable that they should be longer withheld, and if any means by which they may be collected can be hit upon, unobjectionable to the farmers of England, that intelligent class is too much interested in this national stock-taking, to think of throwing any hindrance in the way. I think I have hit upon a mode by which the desired information might be easily collected every year, with very little expense to the country, with very little trouble, and without the slightest annoyance to the farmer.

The reasons why all schemes hitherto proposed have failed to obtain the acceptance of the British farmer are two in number: in the first place, they have been too minute and prying; in the second, they have, for the most part, been enforced.

Now it is not to be wondered at that an enforced return should arouse the opposition of those who were

expected to make it, especially when the expense of it was to be saddled upon them as well. Were the requirements of the return such as commended themselves to their judgment even, I much doubt whether the fact of its being enforced would not erect the British bristles on their backs. A Briton led out to be shot or beheaded, speechless and uncomplaining with respect to all else, finds a tongue, and flashes indignant glances, when the executioner advances to pinion his arms and blindfold his eyes. The last symbol of liberty, temporary as it is, is too dear to be yielded without a struggle; and the bold yeoman, true to the instincts that have brought him to the position he now occupies, will sooner make an unpalatable return with a free hand, than a palatable one covered by legal penalties.

But the schemes proposed have not only been involuntary, but prying. The farmers, in common with the rest of the community, writhe too painfully under the excruciating lancet of the income-tax assessor, to contemplate with patience the approach of another set of operators

designed to lay bare the arteries of their fiscal system. At a time when certain landlords indulge in a very suicidal knock of turning all facts of increased production against those who, by the exercise of unusual skill, or the expenditure of large capital, are answerable for them, it is not very wonderful that the farmers should desire to cultivate a reticence that may save their tempers, as well as their pockets. The spirit of progress has been too much taxed in this way, to induce betrayed husbandmen into laying open their books or their impressions to the scrutiny of those who may not be very immaculate in the use they make of information wormed out under the official seal of confession. The farmers, in fact, do not underrate the value of agricultural statistics, but they consider that the remedy may prove worse than the disease. All that is wanted is a *simple voluntary* return; such an one as will afford no assistance to landlords who tax and nip the improvements of their tenants. A return of this nature is, I feel persuaded, easy to obtain; for the apparatus required in its collection is already in operation, and the farmers would throw every facility in the way of a scheme from which they would derive quite as much benefit as the corn-merchants.

The objects of inquiry should be very few. Three questions would suffice: "What is the extent of land under wheat?" "What the extent under barley?" "What the extent under roots?" Instead of the last, it might be well the first year to ask, "What number of acres are comprised under your occupation, grass and arable?"—a question that might perhaps be put once in twenty years. What more is wanted? Given these data, the agricultural state of the country can be built up synthetically. No one could receive these facts without knowing more; little more of real value would remain to be told, and those who wanted to go further would find it easy to proceed by inference.

Returns of *quantity*, based upon *estimates* of the growing crop, would be utterly worthless, and if compiled from farmers' account-books would come too late to be of the slightest practical utility. In the one case every harvest proves how unreliable are the conjectures of men concerning their own crops. "The wish is father to the thought," and farmers are proverbially given to exaggerate both their losses or their gains. To be of use, such statistics should be published in August; to be published in August they must be made in May and June, to give time for tabulation; and of what utility would be an opinion of the wheat crop formed before the ear had appeared or burst into flower?

No information with respect to quantity, therefore, need be solicited. Quantity, as a necessary element of the calculation, could be more reliably filled in from another source—I mean from the elaborate annual returns which the *Mark-Lane Express* and *Agricultural Gazette* have now published for some years, just before harvest, and which have been obtained from leading men in each district of England.

These hypothetical but efficient averages, applied to the area under each crop, as officially returned by the "260,000 farmers and occupiers of land for the purposes of cultivation" (Census 1851), would give us all the information we require, and save us from such costly mistakes as the one we made when, in the early part of 1846, we allowed France, advised by statistical information of her own prospective wants, to buy largely in our markets at 46s. to 50s. per qr., and were ourselves, nine months later, compelled to fill up the vacuum thus created by the purchase of wheat at the rate of 102s. per qr. I am aware that those in authority might decline to render Government dependent upon returns obtained from private sources. There is nothing in this objection, so far as the scheme is concerned, however; because the same class of

men to which the editors of the Journals just mentioned apply, would as readily supply their impressions to the Government as to any other quarter.

As for the *modus operandi*, a very few words will suffice. All the apparatus required already exists as I said before, and is to be found in the department of the Registrar-General. I am informed that the 260,000 farmers just named are distributed throughout the districts of about 1,800 rural registrars; and to these officials, who have conducted two census returns with great ability, would I entrust the main portion of this work. Provided the additional remuneration bore a convenient relation to the additional duty, they would raise no objections to the arrangement.

To each registrar would be forwarded a list of the farmers in his district, compiled from the books in the Census Office. This list he would be directed to correct by the poor-law rate-books, and to return to the head office after having issued the applications for information. These applications or forms, containing the three questions specified above, should be accompanied by a letter stating the objects of the inquiry. It would be necessary to post them between the 1st and the 15th of June. At the end of the month a list of farmers who had neglected to make the return should be forwarded to the rural registrars, who would be directed to visit and solicit them to comply with the request they had received; and, in case they objected to the enquiry, to answer the questions themselves from the most reliable sources at hand. Some nonconformists to this proceeding would no doubt be found; but from what I know of the farmers of this country they would be but comparatively few. More would neglect the solicitation from ignorance than from any spirit of resistance.

The cost of these statistical returns would be but small. The conversation I have held with certain gentlemen engaged in the Census Office induces me to believe that they might be obtained for £12,000 to £13,000 a year; a small sum surely, when placed side by side with the magnitude of the advantage gained.

I have not thought it necessary in this paper to say a word concerning the necessity of Agricultural Statistics, because no thinking man now contests that point; and their collection has only remained undone because of the discussion aroused about the doing of it and the paying for it. It is not probable that the farmer will bear the exclusive burden of what benefits other classes of the community equally with himself, nor is he likely to submit to an involuntary service which is liable to be turned to his own injury; but no one is more willing than he voluntarily to incur the trouble, and share the expense of obtaining information which would place him on a level of the farmers, merchants, and speculators of Europe, who are nearly all supplied with the very means of forming a prospective opinion of their wants, which he lacks.

DROP-DRILL COMPETITION.—On Saturday, April 4th, the competition for the two prizes offered by Messrs. Jekyll, Glasier, and Pratt for the best and second best 'practical invention for a drop-drilling turnip and mangold wurtzel seed, at intervals of 12 and 18 inches apart,' took place on Mr. Evans' farm, adjoining the Riseholme toll bar. There were five competitors, the number being reduced owing to the unfavourable weather. A good many practical farmers were present to witness the interesting operations. Messrs. R. B. Richardson, R. G. F. Howard, and S. Pille were judges, and they awarded the first prize 15 guineas, to Mr. James Coultas, jun., Perseverance Ironworks, Spittlegate, Grantham and the second, 5 guineas, to Mr. Watson, Harms'ton. It was generally considered that by the new method a saving would be effected in the seed, and also in the labour of thinning the plant, of 3s. 6d. per acre.

IRELAND AS SHE IS, SHOULD, AND WILL BE.

That Ireland possesses abundant resources of wealth sufficient to maintain a large population, and that she is at present in a transition state to the better, are propositions that are susceptible of a tangible demonstration. True, her population for some time past has been on the decrease; but this is only the old oriental story of the goats and donkey that accidentally got into the vineyard, providentially as it were, to teach fallen mankind the art of pruning; for although the gardener grumbled loudly at the time, and cursed the misfortune as irreparable, yet subsequent experience with a little sober reflection taught him that the snubbing of an over-luxuriance of the rambling, woody branches greatly increased the produce of his land. And just so is it with the over-luxuriant agricultural population of the sister-country; for the tooth of the donkey is effectively doing its work, in spite of all the Parliamentary-craft and priest-craft to the contrary that now prevails.

In illustration of this, we have first to turn attention to the fact that exactly the same thing continues to be experienced in England and Scotland, viz., a reduction of the agricultural population. Thus quoting the *Times* of April 1, we have—

Employed in English agriculture in 1851..	2,094,153
" " " in 1861..	2,010,454
Reduction during the ten years . . .	83,699
Employed in Scottish agriculture in 1851..	388,208
" " " in 1861..	378,609
Reduction during the ten years . . .	9,591

With this decrease of the population there has also taken place a decrease of small holdings in the United Kingdom, a large number of these having been consolidated into large farms; and while these changes have been taking place the agricultural produce has been increasing, and also the population in the other branches of industry.

The practical conclusion to be deduced from this is, that the agricultural interest of the United Kingdom through the instrumentality of improved machinery, manures, &c., do more work and procure from the land a greater amount of produce with fewer hands in 1861 than in 1851.

Identically the same conclusion may be premised of the land of the sister-country. And this is equally applicable to her sea, river, and lake fisheries. Nor are her manufacturing and commercial resources the smallest fraction behind those of the United Kingdom. In all these branches of industry Ireland possesses many natural advantages, and what is more, she is at the present moment struggling against odds, but preparing herself eventually to enjoy these advantages.

The natural resources of Ireland are soon told, and her malady is no less a secret to practical observers. It is, however, an old malady to which mankind in general are naturally subject. Cursed is Ireland for Ireland's sake for example, and she does not yet know it? "In the sweat of her own face, heaven and earth have long been calling upon her to eat her bread, but she is only now awaking out of sleep to hear it! The Divine command was given to her at the same time

it was given to England and Scotland, viz.: "*Be fruitful and multiply and replenish the land.*" But she did not understand it, and has therefore allowed them to go past her in the race of progress. To this Divine order of things she has even hitherto proved herself diametrically opposed, generally speaking, as if purposely or otherwise to illustrate the practical characteristics of Antichrist. Individually, this is not altogether applicable; for it may truly be said even generally speaking, that Irishmen out of Ireland and from under the subjugating yoke of Parliamentary craft and priest-craft *do well*, but Ireland at home in a national and general sense is yet, as a whole, in "*the gall of bitterness, and in the bond of iniquity,*" temporally speaking. Instead of training up her offspring to industrious habits in accordance with the Economy of Grace, if we may use the expression, from infancy to that period when they should enter upon the duties of paternal life themselves, she has hitherto pursued the opposite of Solomon's golden rule. It is painful to say so, but the plain truth under the circumstances of the case requires to be candidly told, and what has been said above is equally applicable to churchmen, catholic, and presbyterian.

Of Ireland's wealth and Ireland's poverty, perhaps the least said is the better. The grand question is the remedy, and here the medical maxim of finding out the seat of the disease is applicable; for, until Ireland see her own shortcomings, how can she be expected to own and mend them? True, it has been said that the Celtic mind is naturally devoid of those enterprising faculties that lead the way and control great industrial undertakings; but we demur from the general application of this hackneyed and fallacious conclusion, for reasons subsequently shown, and therefore we commend to all whose duty and interests are involved, first, to study the true philosophy of industrial life, and then to teach the same, so as to raise the whole body of the Irish people from their present low state to a higher level than what is at present occupied by the industrial classes of the United Kingdom, such being their natural position.

Practically and generally speaking, the true and only way of elevating Ireland to her natural level is the adoption of the most economical subdivision of labour in the development of her various resources of industry and wealth.

In illustration of this, it may in the first place be observed that her vast extent of bogs, so often quoted against her, have recently been proved to possess immense resources of employment and mercantile wealth, in their conversion into fuel, candle, oil, and other products of modern discovery, and that this branch of her industry and wealth is beginning to be slowly developed. In the second place, her moist, warm climate, the proximate cause of her bogs to a very large extent, is favourable to mixed husbandry, under proper drainage, deep cultivation, and aeration by steam-culture; and in this the chief and parent-branch of industry the sister-country is also beginning to awake out of her long dreamy sleep, and to show signs of new-born life. True enough the means to an end in this branch of industry are not in accordance with the generally conceived notions of Irishmen, but that is no valid argument, and although it may transfer the majority of the

Celtic population to America, and retard for a time the march of improvement in Ireland, it will only in the long run make the conquest of steam, capital, and skill all the more triumphant; and in this race of progress, slow as it is at the present time, we venture to predict that although the southern and western provinces are behind the north, the tables eventually will be turned against Ulster, whose pseudo-tenant-right and small farms are diametrically opposed to the most profitable subdivision of labour. The phrase "*tenant-right*" is a very attractive one, and few have had more reason to uphold it in its integrity than the writer; but in Ireland it requires to be seen to be properly understood. Thus it was principally in the county of Armagh, where the drainage, embanking, and other engineering works we were carrying out when resident in the sister-country were situated. The estate was a large one, but the greater area of the arable land was worth less per acre for improved agriculture, and the highest degree of prosperity and population, than had it been lying in its original unreclaimed state; and yet on naturally rich productive land reduced to poverty by mismanagement under the continuous growth of potatoes, wheat, and flax, the poor tenants in rage, in our employment at a *shilling per day!* were as proud of their tenant-right as was our noble employer of his ducal crown, and over the whole of this large estate the tenant-right was estimated at £10 per acre, without any apparent regard to the amount of tenant's capital invested in improvements. In point of fact, it is not tenant-right in the ordinary sense of tenant's capital invested that has not been recovered, but a *tenant custom*. And fortunate it is for the small tenants of Ulster, so far as our experience extends, that it is so; for had it been for permanent or exhaustible improvements, our employer and the other landlords whose estates we had occasion professionally to examine, value, and report upon, would have had counter recourse in some cases to the extent of £10 per acre for the reduction of the productive value of the land below its original worth. In other words, it cost his Grace about £20 per acre to put into a profitable crop-bearing state several small holdings that were added to the demesne. About the one-half of this sum was for draining and trenching, and the other half for lime and manure, the latter sum of £10 being tenant's capital, the former landowner's capital. This was exclusive of capital expended in roads, fences, and buildings; so that, including the £10 per acre paid to the tenants, the total sum invested exceeded £30 per acre! to which must be added the fee simple to show the true position of the landowner's capital in the province of Ulster!

We cannot prosecute further the details of the pseudo-tenant-right of Ulster at present. That it originated in a scheme of the penniless lairds of the North of Ireland to reclaim their estates with tenants' capital is manifest, so that its foundation rests upon a false principle. What we have said is enough to show that in the long run it will be against both landlords and tenants, and that the southern and western provinces may think themselves fortunate in being free from this drag of something like £10 per acre on the wheel of progress. The landlords of the south and west, however, as well as those of the north, must bear in mind that the land has still to be reclaimed at a heavy expense in clearing the whole face of the country of its miserable small farms and hovels, for estates sooner or later will be laid out into large farms adapted for steam culture and improved mixed arable husbandry. Homesteads and labourers' cottages also require

to be built, and the latter given to the labourers rent free; and their wages advanced to ten, twelve, and fifteen shillings per week, with regular employment all the year round.

As the parent branch of industry is thus improved, manufactories for the manufacture of steam-ploughs, and other improved implements of husbandry, will also be established in the land. There is nothing to prevent this—for the father of the *steam-plough*, McRae, was a Celt; the improver, if not the father, of the reaping-machine, McCormick, was a Celt; the inventor of our water-proof clothes, Mackintosh, was a Celt; and we might go on quoting the obligations the country lies under to Celtic enterprise, in refutation of the fallacious conclusion formerly cited; but the above will suffice. True, in all these cases quoted, our Celtic geni had to be transplanted into fresh ground, and there take root as it were, before they showed evidence of enterprising talent—a fact which reads an instructive lesson to those deluded Irishmen who are at present listening to Parliamentary craft and priest craft, to the contrary of the doctrine thus practically taught. Masons, carpenters, shoemakers, tailors, &c., with the various mercantile interests, will improve and multiply at the same time; so that although the actual number of resident hands directly engaged in agriculture may be greatly reduced, yet the general population of the country will nevertheless be gradually increased, in exactly the same manner as in the United Kingdom.

Ireland's improvement, of which the above is a very brief outline, is doubtless a work of time. The surplus grown-up population now engaged in agriculture, or rather in obtaining a scanty subsistence from imperfectly cultivated land (which does not deserve the name of agriculture), cannot be converted into large farmers, implement makers, manure manufacturers, masons, carpenters, &c. The manufacturing and commercial classes are already sufficiently numerous to multiply and supply the future with an increase of population, and all the artistic requirements of the most improved state of subdivided labour. The plan, therefore, now being adopted by the poor peasantry, of emigrating to America as fast as they can, is a legitimate one, highly commendable; and the only one, too, that is left them, to escape the misery of an antiquated state of things in the mother-country. To stay their progress across the Atlantic is not only to retard the improvement of Ireland, but also to double the miseries which the poor deluded people have hitherto experienced! We should much like to see some effective plan carried out, for mitigating the hardships which they in many respects have to endure when they first arrive in a colony with empty pockets, and a want of experience how to apply their labour; and if those who are now preaching up false doctrines about tenant-right, in order to induce intending emigrants to stay at home, would devise a plan of this kind, Ireland in general, and the poor emigrants in particular, would have good reason to thank them for their kindness; but all the parliamentary craft, priest craft, and know-nothing penniless lairdism in the sister-country will not dam the present current of emigration, nor stay the progress and ultimate success of the great work of improvement now going on in her four provinces. The increased demand for flax, consequent on the American war and stoppage of the supplies of cotton, may hold out for a short time flattering prospects in favour of small farms; but it must be borne in mind, by men of practical minds, that the Viceroy of Egypt has made a discovery, that improved implements and machinery improve his people; and, in short, that half the world has made the discovery that cot-

ton in tenfold abundance to British wants can be profitably grown, so that a few years hence the home growing of flax will be in a worse state than it was in prior to the American war. Add to this the increase of wages now slowly taking place, and the small-farm, tenant-right, flax-bubble in which some have seen the future prosperity of Ireland pourtrayed, will burst into thin air. It is not to be inferred from this that we are against the growth of flax in the south and west of Ireland. We have assisted to grow flax successfully on large farms during our apprenticeship in Scotland, where long wages were paid to servants; and if farmers find that they can do so for the future in Ireland, by all means grow flax, and manufacture and wear it too. But let no one be carried away on the surface of the present demand for flax, for articles of this kind can be grown abundantly elsewhere, and imported at a low price.

Hitherto one of the most enslaving maladies under which Ireland has suffered, is the subdivision of land instead of the subdivision of labour; and we aver it will be no easy matter to convince her of her short-comings in this respect. When England and Scotland began in earnest to consolidate land and subdivide labour, through the instrumentality of chemical and mechanical means, Ireland began to subdivide land and to preach up the pseudo-doctrine of tenant right, which we have shown is but another way of doing the needful for penniless lairds, thereby inflicting two evils upon Ireland—first, the exclusion of the legitimate investment of landlords' capital in the permanent improvement of their estates and the growth of trade; and secondly, the exclusion of the legitimate investment of the tenant's capital in the most improved system of husbandry. Both these adverse movements were opposed to the general introduction of steam and machinery, including improved farm implements, and thereby the most profitable subdivision of labour. From this antiquated position a large area of the country was next thrown into the opposite extreme, the small holdings with their tenants being cleared away to make room for grazing cattle! The first of these extremes, the small holdings, led to the second—the primitive pastoral system; and it were difficult to say which has proved itself the most effective barrier to the introduction of machinery and subdivided labour, so as to establish the permanent growth of a prospering population upon a solid founda-

tion; but taken together, they have proved themselves a heavy drawback to the general welfare of Ireland.

Such is a very faint outline of this comprehensive and still all-engrossing subject. Of the natural fertility, maritime advantages, and industrial resources generally of the sister country, a single question to the contrary has never been and cannot be raised; that she will one day occupy the highly favourable position which she thus holds, is manifest; and that she is beginning to bestir herself in earnest, and more in this direction, is equally plain, for on the cessation of the American war we shall have a regular exodus, and a plentiful supply of American cotton. On the contrary, that she has hitherto suffered much is only the due reward of retributive justice, for having set at nought the Divine rule of making provision for her own wants, "in the sweat of her own face," and from her own sea and land; and, therefore, for the future, instead of parliamentary craft and priestcraft, in order to procure windfalls from every quarter of the compass, she must look old Mother Earth straight in the face, and learn practically the true philosophy of the sacred oracle, "Cursed is the ground for thy sake;" and thus enjoy thankfully the benign blessing which the infallible sentence so forcibly conveys to all who religiously submit to its teaching. Medical writers talk of a "*vis medicatrix nature*;" indeed no little of the success of the curative art lies in prescribing so as to arouse the dormant functions into active play; and this is just the sort of prescription which the Irish malady requires. Instead of bad tools, low wages, hanging over a job to make it last as long as possible, so as to lengthen out employment; and instead of the subdivision of land into holdings of a size insufficient to employ an active hand the one-tenth part of his time, all of which belong to the same system—instead of such, we repeat, manual labour must in the first place be abridged by machinery, so as to procure from sea and land their produce in the greatest abundance and with the fewest number of hands directly employed; and in the second place, this produce must be distributed by a further subdivision of labour through the instrumentality of artificial means. This is Ireland's winning post, and she cannot help herself otherwise, for onwards towards it she must move, in spite of all opposition to the contrary.

THE EXTENSION OF IMPROVEMENT IN OUR BREED OF CATTLE.

The improvements that have been made in our various breeds of cattle since the commencement of the Royal Agricultural Society's operations have been exceedingly great and good. This remark applies to every description of cattle, beginning with the superb and gigantic Shorthorn, and ending with the little hardy Welsh runt. The Shorthorns unquestionably take the palm in the race of progression, but the Herefords, Devons, Aberdeens, and Highlanders have attained a very good place—a high position. The Sussex, the Suffolks, the Longhorns, the runts have also greatly advanced in size and value. To these we now add various crosses in breeding, by which, owing to judicious selections and crossings, many beautiful specimens of cattle are continually making their appear-

ance. The old Irish, again, have nearly all succumbed to the Shorthorn cross. The Kerrys and Ayrshires, as choice milkers not only retain their high popularity, but as animals they are greatly improved in frame and beauty.

We give every honour and every credit to those spirited breeders, those earnest improvers of their country's herds, for the immense good they have achieved, and for the vast wealth they have conferred, or rather have showered down, upon their country. We most ardently wish that such invaluable efforts and astonishing results were more highly appreciated and more generally adopted. The improvements of the various breeds of cattle have attained to such a high standard of merit as to leave but little hope of any considerable advancement for the future. We make

no pretension to know in what dwells absolute perfection, but we do know that very many of our prize animals come very near that most elevated standard—the bull Royal Butterfly or the heifer Beauty's Butterfly (both bred by Col. Towneley) for instance. Who can desire to see more splendid specimens of bovine beauty, proportions, and merit than these two animals manifested in their best days? Now this is as it should be. The breeds of cattle are nearly perfected. The astonishment is, that they are not universally diffused.

This is the point I wish to make in this short paper. It is not that the breeds of cattle are not sufficiently perfect; it is not that the benefits of these improvements are unattainable; but it is that the general agricultural public take but little note of them. It is that the general or ordinary farmer cares but little for such improvements. It is that they are too supine and indifferent about these things, not to say too ignorant of such a wonderful advancement in this one of the most important departments of their business. I am pained to say it, that in these enlightened days of agricultural progression so little interest is felt therein by, I fear, the majority of our farmers. With many of them (as it is too frequently said) "a bull is a bull, and a cow is a cow." The main thing is to expend as little money as possible, and to provide things cheaply—*i.e.*, low in price, which does not always prove cheap. Many instances come under my notice to verify these ungracious remarks. One of Col. Towneley's best bulls was introduced into a district which everyone thought was fully alive to agricultural advancement. It has its agricultural society, and a flourishing one too. The farmers are well-to-do and intelligent, and many of them breed extensively; although it is not, in the strictest sense, a breeding country. The old standard class of Shorthorns are of the common useful country-kind—having no pretensions to pedigrees or high worth, with a few partial exceptions. They are known as Lincolnshire Shorthorns, and lack that compactness of form and proportionate symmetry of the Durham Shorthorns. Few districts stood more in need of a change. I saw this beautiful animal shown in the public market, and near him was exhibited a popular country bull of the same age. The one was almost the perfection of a Shorthorn bull: noble in appearance, of fine full frame in beautiful proportion, handsome head and very kindly countenance, light offal, and skin and coat all that can be desired: a better is seldom seen. The other was a short, rather thick, low-standing, useful country bull; about the average of his class; nothing whatever to recommend him in the eyes of a true Shorthorn breeder. The two bulls, as standing together, were good specimens of their respective classes: the one a true type of the improved Shorthorn, the other of an old-fashioned useful country bull. Now it would be thought by every enlightened breeder that the improved Shorthorn would have taken great credit, and obtained an extensive seraglio. But no; the proprietor charged ten shillings per cow, the other five shillings, and this sufficed to influence country breeders, with a few exceptions. Nor do good instances of success make much difference. I was passing along a road the other day, in which were a lot of

yearling cattle. One of them struck me as being altogether superior to the others, and upon inquiry I ascertained that its sire was the improved Shorthorn bull named above. The superiority was very evident—so much so that in the open market, without any knowledge of its history, it would make twenty-five per cent. more money than its fellows. I name these facts in proof that as yet, notwithstanding all that has been done, and all that has been taught, our farmers are still slow, as a body, to learn and move. It is a work of much labour, and requires much time, to drag them out of their accustomed habits and long-harboured prejudices. Still the good work is progressing, and I bring these homely and common facts before the readers of this magazine to induce them to use their endeavours to extend the great benefits of the improvements already established. It is more from want of steady, quiet consideration that they are not adopted more extensively. I would not by any means advise ordinary farmers, who breed annually a few calves, to purchase a high-priced bull; but I would strongly urge them to make use of the best animal within their reach. In many districts it has become the practice of good and considerate landlords to procure a first-class bull for the use of their tenantry. This cannot be too highly appreciated. Just think of the great advantage to be derived from breeding good stock, instead of the ordinary kinds! The very calf, immediately it has "dropped," is fully worth twenty to thirty per cent. above the common runs in the market, and as it grows up it maintains its full value in proportion till it reaches the butcher's stall. Nor is this all. First-class breeds come to much earlier maturity than ordinary breeds, so that more can be fattened off in the same space of time.

These few self-evident facts will, I hope, suffice to call attention more prominently to the subject, and lead to the more general extension of the improvements I advocate.

EFFECT OF PHOSPHATE AND POTASS MANURE ON THE CULTIVATION OF THE POTATO.—Baron Liebig recently delivered a discourse before the Munich Academy of Sciences, on the subject of the cultivation of the potato crop. He alluded more especially to the experiments relative to the laws of the nutrition of plants which have been made under the auspices of the Institute of Physiology, by Professor Nægeli and Dr. Zoëller. These experiments were thus carried out: Three fields were selected; in the first the soil consisted of plain powdered turf of Kolb; in the second, formed of the same soil, the ground was manured with ammoniacal salts; while the third, whose soil was the same as that of the other two, was manured with the fixed elements, which constituted the ash of the tuber. An equal number of tubers was planted in each of the three fields. The field manured with ammoniacal salts produced more than the first; but the third, which had received phosphate of lime and potash, was the most fertile of the three. The results being represented by figures stood thus: 1st field, 100; 2nd do., 120; 3rd do., 285. From these results it follows that the farmer may avoid the carriage of large masses of animal manure to his potato fields, by supplying a judicious mixture of phosphate of lime-

gypsum, and wood ashes. The different results of the three experiments can alone be attributed to the different compositions of the three soils, all other conditions having been identical. In the two first cases, there were absent those conditions necessary to produce in the subterraneous parts as many organic substances (tubers) as in the third; or in other words, to draw them from the atmosphere. Baron Liebig observes that these indications are not the most important results of the experiments alluded to. It was also found that all the potatoes drawn from those fields which did not possess the mineral ingredients in sufficient quantity were attacked by the disease; and, after a few weeks, the decomposition had

extended to the interior of the tubers. On the other hand, the tubers grown in the third field, which had been manured with the mineral elements of the plant, remained perfectly healthy, and none of them exhibited the slightest trace of the attacks of *Oidium*. It is therefore unquestionable that the conditions favourable to the normal development of plants are also those which tend to prevent disease, and that the first cause of the disastrous epidemic should be sought in the soil. If the latter possesses in sufficient proportions the elements essential to the discharge of the proper functions of the plant, this in its turn will be enabled to resist and paralyse the injurious influences which tend to affect it externally.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY COUNCIL: *Wednesday, April 6.*—Present: Lord Feversham, President, in the chair, Lord Walsingham, the Hon. A. H. Vernon, Sir J. V. B. Johnstone, Bart., M.P., Sir E. C. Kerrison, Bart., M.P., Sir A. K. Macdonald, Bart., Sir Matthew White Ridley, Bart., M.P., Sir J. V. Shelley, Bart., M.P., Mr. Raymond Barker, Mr. Barthropp, Mr. Bowly, Mr. Bramston, M.P., Mr. Cantrell, Col. Challoner, Mr. Clayden, Mr. Dent, M.P., Mr. Druce, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Holland, M.P., Mr. Hutton, Mr. Jonas, Colonel Kingscote, M.P., Mr. Lawes, Mr. Lawrence, Mr. Milward, Mr. Pain, Mr. Pope, Mr. Randell, Mr. Rigden, Mr. Shuttleworth, Mr. Robert Smith, Mr. Thompson, M.P., Mr. Torr, Mr. Wallis, Mr. Wells, Professor Wilson, Mr. Frere, Professor Simonds, and Dr. Voelcker.

The following new members were elected:—

Alington, Henry, Little Barford, St. Neots
 Appleby, William Smallburn, Longhorsley, Northumberland
 Armstrong, Ch., Hawthorn Terrace, Newcastle-upon-Tyne
 Ashwin, Henry, Guiting Power, Winchcombe
 Ayton, J. Featherstone, Hindley, Stocksfield, Northumberland
 Baker, Hugh Massey, Kidnal, Malpas
 Baker, Robert, Garnston, East Retford
 Barrett, Alfred, Reading
 Beale, Joseph, Boro' Fields, Walton, Burton-on-Trent
 Berners, The Right Hon. Lady, Keythorpe Hall, Leicester
 Bugg, Walter, Milborne Wick, Sherborne
 Cholmondeley, Col. Hon. T.G., Abbott's Moss, Northwich
 Clarke, J. Goff, Brackley, Northampton
 Collison, William, Beverley
 Coulman, John, Red House, Thorne
 Cunningham, Captain, 3, Great Stanhope Street, W.
 Davis, J. Thornton, Hepscott Red House, Morpeth
 Davison, John, Trillington, Morpeth
 Dining, Joseph, Langley Hill Top, Haydon Bridge
 Donersaile, Viscount, Donersaile Court, Co. Cork
 Donkin, Samuel, Bywell, Felton, Northumberland
 Dunn, Wm. H., Inglewood, Hungerford
 Fenwick, J. C., Riding Mill, Northumberland
 Gambles, Herbert E., Nocton, Lincoln
 Gamgee, Prof. John, New Veterinary College, Edinburgh
 Garbutt, Cornelius, Dunston Lodge, Gateshead
 Gibbs, Phillip H., Eckington, Worcester
 Gilpin, James, Roseworth Villa, Newcastle-upon-Tyne
 Gray, John C., King's Grange, Castle Douglas, N. B.
 Halewood, Edward, Great Crosby, Lancaster
 Hall, Charles, Croydon, S.
 Harrison, J. F., Caterham Court, Redhill
 Hawthorn, William, Benwell, Newcastle-upon-Tyne
 Heath, Thomas, Little Benton, Long Benton
 Henderson, W. Fowberry Maines, Belford, Northumberland

Hunter, William, Moor Lodge, Newcastle-upon-Tyne
 Innes, William, Field Place, Warnham, Horsham
 Large, William, Taywell House, Goudhurst
 Lovett, William, Glassenburg, Cranbrook
 Lightfoot, F. L., University College, Oxford
 Lyne, Robert L., Oldington, Stow-on-the-Wold
 McLaren, Henry, Hylton Castle, Sunderland
 Myers, Christopher, Dunston, Gateshead
 Parker, Henry, Low Elswick, Newcastle-upon-Tyne
 Pollard, George, Dilstone, Corbridge
 Pollock, George D., 27, Grosvenor Street, London, W.
 Porter, James, Corney Bury, Buntingford
 Potts, John, Gateshead
 Ronaldson, J. T., 4, Victoria Terrace, Newcastle-on-Tyne
 Row, Edward, Moulas Haugh, Acklington
 Shiell, John, Kanton, Newcastle-upon-Tyne
 Smith, T. Fenton, Ilsworth, Gateshead
 Spencer, James, jun., Newcastle-upon-Tyne
 Spencer, William, Team Villa, Gateshead
 Surtees, Villiers C. V., Benbridge Ho., Newcastle-on-Tyne
 Swan, Joseph, High House, Morpeth
 Thompson, Captain F. W., Willow Lodge, Finchley
 Trotter, William, South Acomb, Stooksfield
 Walker, Thomas S., Maunby Hall, Thirsk
 Watson, Robert H., Bolton Park, Wigton
 Williamson, Sir Hedw., Bart., Whitburn Hall, Sunderland
 Wilson, Joseph, Manor House, Woodhorn, Morpeth
 Wood, Charles A., 25, Chesham Place, London, S.W.
 Woodhouse, John, Skerton, Lancaster
 Wrightson, John, Spring House, Ladberge, Durham
 Young, John, Kenley House, Coulsdon, Croydon, S.

FINANCES.—Mr. Bramston, M.P., presented the report, from which it appeared that the Secretary's receipts during the past month had been examined by the Committee, and by Messrs. Quilter, Ball, and Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on March 31 was £2,295 1s. 10d. The balance-sheet for the quarter ended March 31, 1864, and the statement of subscriptions and arrears were laid on the table, the amount of arrears then due being £554. The Committee recommended that a further sum of £1,000 be placed on deposit with the Society's bankers.

DISCUSSIONS.—Mr. Holland, M.P., announced that he would read a paper on Agricultural Education, on Wednesday, April 20, at 12 o'clock. Professor Voelcker will deliver a lecture on the Atmospheric Food of Plants, on May 11.

IMPLEMENTS.—Colonel Challoner, Chairman of the Committee, reported their recommendation that a special meeting of the Committee shall be held in February in

each year, to report to the Council on the quantity of trial land and other requirements to be provided by authorities of the localities inviting the Society to hold its country meeting in the following year. That Messrs. Easton and Amos be requested to report on Mr. Fowler's suggestion that there should be one dynamometer equal to about 3 tons, and two equal to about 12 cwt., also one break which will register the power given off by ploughing engines, together with the cost of providing what may be necessary. That the trials of steam-cultivators be triennial. This report was adopted.

NEWCASTLE MEETING.—Colonel Challoner reported that the plan of the show-yard had been finally settled; that Mr. Jacob Wilson had secured 34 acres of land in two fields for the trial of steam-cultivators, contiguous to the land already provided by the local Committee for the purpose, who also placed an additional 40 acres at the disposal of the Council, on the condition that it be used exclusively for the trial of steam-cultivators. Mr. Jacob Wilson had been requested to accept the office of Steward of Forage, and the Committee recommended that he be allowed an assistant at the rate of not exceeding £5 per week. The Committee further resolved that Lonk sheep are not qualified to compete in the Black-faced Mountain Classes. A discussion ensued on this resolution, which was ultimately carried by 16 ayes to 9 noes. The report was adopted.

DATES OF CALVING.—The President reported that the Committee having fully considered this question, were unanimously of opinion that any alteration in the date of calving would be inconvenient and thus unadvisable.

A committee consisting of the Earl of Powis, Sir Ed. Kerrison, Bart., Sir J. Johnstone, Bart., M.P., Colonel Kingscote, Mr. Acland, Mr. Barthropp, Mr. Druce, Mr. Holland, M.P., Mr. Wren Hoskyns, Mr. Thompson,

M.P., Mr. Owen Wallis, and Professor Wilson, was appointed to consider the measures which ought to be taken "for the improvement of the education of those who depend upon the cultivation of the soil for their support," this being declared by the Charter as the 7th National Object to be prosecuted by the Society.

The following Committee was appointed to consider a report from the Horse-Breeding Committee of the Royal Agricultural Society of Ireland, viz., the Earl of Powis, Lord Berners, Lord Tredegar, Hon. Col. Cotton, Hon. General Hood, Sir E. Kerrison, Bart., Sir Watkin Wms. Wynn, Bart., Colonel Kingscote, M.P., Mr. Burnett, Mr. Dent, M.P., Mr. Fisher Hobbs, Mr. Milward, Mr. Pain, and Mr. Torr.

The appointment of a committee to consider a letter addressed by Messrs. Howard to the President relative to the office of Consulting Engineer to the Society having been moved by Mr. Fisher Hobbs and seconded by Mr. Clayden, an amendment was brought forward by Mr. Milward, that, as the facts are admitted, there would be no advantage in appointing a committee. After a full discussion by the Council, the amendment was carried by 18 ayes to 8 votes for the original motion.

MEETING OF 1865.—Memorials with plans and section, signed by the Mayors and Town Clerks of Exeter and Plymouth, were presented, soliciting the Council to hold the Society's Country Meeting at those places in the year 1865; and a committee, consisting of Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Pain, Mr. Randell, and Mr. Torr was appointed to inspect the various sites offered for showyard and trials, and to report to the Council on the 4th May. The Secretary having announced a vacancy in the Council by the decease of the Right Hon. Lord Ashburton, Vice-President, gave notice that the election to fill this vacancy would take place on the 4th May.

FLAX CROPS IN ENGLAND.

SIR,—I trust the importance of the subject will plead my apology for asking a corner of your space for the following remarks on flax culture. I have been led to make this request from hearing that English farmers have already turned their thoughts to the subject of flax crops, and from seeing some articles and letters in newspapers on the prospects for and against the substitution of flax for wheat &c., in a rotation in England.

I would not for a moment presume that your readers are not fully aware that flax will grow on almost any kind of soil so long as it is hearty, and in nearly every climate; but I believe it ought to be carefully considered that to raise a paying flax crop, deep loam and a climate somewhat moist are desirable, especially when the crop is put into competition with other crops that will pay better than flax on other kinds of soil. If writing for Ireland, I would say that land may be devoted to flax almost at random, not so much because of the great prevalence of loam, as from the richness of the soil generally, and the peculiarity of the climate.

Besides, every part of that country possesses a large proportion of good flax ground; and in no part are there, to any extent at all to be compared with England, so good wheat, or pea or bean soils, although in oat soils both countries may be about equal. But what Ireland has in climate is even more than overbalanced just at present by the superior condition of English lands, the more general adoption of drainage, and the advantages of good implements of husbandry. Also, and above all, English farmers must, as a condition of tenancy, have and employ capital in their operations; whereas the customs of Ireland justify, under the name of tenant-right, the parting with from £10 to £30 per acre, without an equivalent in tenure, which leaves the bulk of Irish farmers without capital; and what is still worse, those who have it do not employ it to any such extent as is usual in England.

Therefore in comparing the prospects of the English and Irish farmer in regard to flax crops, the English has an equal footing just now, and can raise as high a differential¹

profit by sowing from one-tenth to one-seventh of his tillage land with flax seed, as the Irish can do by a like mode of disposing of his lands.

But the position both occupy in regard to the growers of cotton is, that even though cotton should come down to the lowest price of the last ten years, flax may still be grown profitably provided its culture be gone about properly.

The cultivation of an acre of flax need not exceed £7, and if gone about on a large scale may be brought down to £6, and the yield on the average may be taken, at the very lowest, at 32 stones of 14 lbs., or 4 cwt., and the price for good flax 7s. 6d. to 10s., average £70 per ton (last year the yield in some cases doubled what I name); which, after paying rent, will still leave a large profit *over and above* the value of the bolls for feeding, and the shaws for bedding pigs, or for manure. But if the crop be cultivated chiefly for sowing seed, which implies a comparative disregard of the fibre, £40 or even a lower price per ton for such fibre would pay; and this, as is well known, would compete with cotton, even though it came to its former low price, which consideration ought to be regarded sufficient to satisfy the most timid farmer, even though he should still indulge the idea of cheap cotton ever coming to these countries again.

There is but one other thing with which I would trouble you (though I should like to make some suggestions about the steeping and bleaching parts of the process, and I may do so at another time): it is, that so far from flax being only a poor man's crop, the very contrary is the case, for no poor man can grow it profitably. I have been over the length and breadth of Ulster, time after time, for the past six or eight years, and whilst I was collecting information in regard to other parts of Ireland's resources of industry, I was also most attentive to flax culture; and I find that the notion that flax is the thing for cottier farmers with large families, has had its foundation in the excessive fertility of certain writers' imaginations, whose poetic notions of practical life led them to suppose

the thing ought to be so. The labour about a flax crop is too important, and in the latter stages too severe, to be done by young people or women, if done rightly; and therefore I find that not only in Ulster, but in every other province, the rule is, that when a large farmer gives flax a place in a seven-year rotation, and does so steadily, it pays him on the average; but where flax is grown by fits and starts, it can neither pay the grower, nor create a local market; much less can the confining of its culture to the jobber in consacre, or the cottier, ever bring about these and other conditions necessary to make the crop pay. If, however, it be cultivated in its place, and kept up regularly, money can be safely laid out in providing implements for its management; but on no other condition ought it to be tried. Besides, from a careful induction of facts, to which I cannot even refer at present, lest I should trespass on your space too far, I hesitate not to say that if all our English, Scotch, and Irish farmers took to flax culture to the fullest extent prudence and the laws of agriculture would admit of, the supply would not be too large for the demand, nor need any one fear, as a consequence of a large extension of flax culture, the cutting off of the supplies of foreign; much less need it be supposed that flax can altogether supplant cotton, or substitute it at all in certain fabrics.

The natural, necessary, and speedy result of extensive flax-growing all over the United Kingdom would be to give a new impulse to textile trades, by which progress generally would be promoted, and in which results farmers above all others are interested; as, after all, a home consumption of beef, mutton, and corn must depend on the existence of manufacturing industry, which in turn must also rest on raw material; and so long as any quantity of that can be home-grown as cheaply as imported, it is so far forth well to provide by its culture against the contingency of foreign relationship being now and again unsettled.

Yours respectfully,

W. GLENNY CROFT.

Dublin, April, 1864.

GENERAL GARIBALDI AT BEDFORD.

Annexed will be found a kind of semi-official report of Garibaldi's visit to Bedford; but having ourselves spent some time in the town during the week, we are enabled to point this account by a few further particulars more especially referring to the object of the General's trip. A very significant incident occurred immediately on the illustrious stranger's arrival at the Britannia Works, where, being formally introduced to Mr. James Howard, Garibaldi met the presentation with the remark that he knew Mr. Howard very well. On the latter expressing his doubts as to ever having previously had the honour of seeing the General, the rejoinder was, "But I have your portrait in the *Farmer's Magazine*," a work to which, it appears, Garibaldi is a regular subscriber; a fact that shows how sedulously he has cultivated alike the arts of peace and war. His criticism on the work made by the pair-horse plough and the champion man George Brown, was much to the purpose. Admitting that the performance was very good, the General went on to say that the horse-

ploughing in England was too shallow for hot countries, where they were compelled to go very deep, or all the moisture would be carried off by evaporation. With the steam ploughing, or more particularly the *cultivating*, he was much pleased, quickly comprehending the mechanical action of the system, as well as the advantages of increased depth and the way in which the weeds were left on the surface. The land selected for operation was a stiff heavy clay of three or four inclosures recently thrown into one, and altogether a rough and trying job; but the cultivator was more than equal to the occasion. Garibaldi is manifestly well up in all farming matters, and evinced a deal of interest in the stock on Mr. James Howard's farm, where improved shorthorns, Clydesdale horses, and Yorkshire pigs, all in turn received due commendation; while he made very "good work," as he expressed himself determined to do in planting his tree; and left his name not only in Messrs. Howard's album, but under a red letter heading in the visitor's book of the

firm. Many a welcome as Garibaldi will have in England, we question whether there will be anything more after his own heart than this day in the well-cultivated lands of Bedfordshire.

THE MESSRS. HOWARDS' WORKS.

On Friday, April 15, General Garibaldi left Stafford House at half-past nine o'clock for the Great Northern Railway station, en route for Bedford. He was accompanied by the Duke of Sutherland, Menotti Garibaldi (his eldest son), Lord Albert Leveson Gower, General Eber, and Colonel Peard (Garibaldi's Englishman). The object of the visit was to see the steam plough at work. It becoming known in the neighbourhood that Garibaldi would pass through the principal thoroughfares on his way to the station, crowds had collected before ten o'clock. A special train, consisting of four saloon carriages belonging to the Midland Railway Company, was in attendance to convey the distinguished party to Bedford. Among those present to welcome the General at the King's cross station (the platform of which was crowded with ladies—were Major Amawick, Captain the Hon. Octavius Duncombe M.P., and Mr. Faber, directors of the Great Northern Railway; Mr. Ellis, director of the Midland Railway; Mr. Seymour Clark, general manager; Mr. Walter Leith, sub-manager; and Mr. Oakley, secretary of the Great Northern Railway; Mr. Allport, general manager of the Midland Railway, and other officials; Lord Alfred Paget, M.P., and Mr. Alderman Mechi (by whose recommendation Bedford had been selected). Mr. McConell and other scientific gentlemen were also in waiting to accompany the party. Garibaldi arrived at King's Cross at 10 o'clock, having been greeted with loud acclamations outside the station from the assembled crowds, and he was received with scarcely less demonstrative feelings on the platform, where many ladies pressed forward eagerly to shake hands with him. The train, propelled by an engine gaily decorated, started at 10 15 a.m., and ran the distance of 50 miles to Bedford in one hour and five minutes. Slacking speed before reaching the town, the train was brought to a stand opposite the Britannia Works—the great depot for manufacturing agricultural machinery, carried on by Messrs. J. and F. Howard. Here a temporary platform had been erected, decorated with flags and evergreens, upon which the Mayor of Bedford (Mr. James Howard), Mr. Whitbread, M.P., and all the other leading residents in the neighbourhood awaited the arrival of the General. On alighting, Garibaldi was introduced by Alderman Mechi to Messrs. Howard, with whom he cordially shook hands. The Britannia Works form a conspicuous object from the railway. They are in the form of a square, and have been constructed with considerable architectural skill. Their magnitude may be understood when it is stated that Messrs. Howard employ daily nearly five hundred men. Garibaldi, conducted by the Messrs. Howard, first proceeded to the smiths' shop, where the various parts of their steam and hand-ploughs are manufactured. Thence he passed to the foundry, where an opportunity was afforded him of witnessing Messrs. Howard's ingenious method of moulding, by which much labour is saved, and better castings

secured. The admirable discipline observed by the workmen was shown in a remarkable manner in this shop, where when the General entered upwards of 200 men were busily engaged. Not a man ceased work, although all were evidently interested with the General's visit. Garibaldi asked many questions as to the wages earned by these artisans and by the agricultural labourers of the district, and expressed his great satisfaction at the remarkable ingenuity displayed in the construction of many of the machines shown to him. From the foundry the General was conducted through the stores, where the admirable order in which everything was preserved attracted his attention. Having concluded his inspection of the works, Garibaldi entered the Mayor's carriage, and, with the members of his suite, proceeded with him to his residence in Bedford, where an elegant luncheon was served to a large party. The whole population of Bedford was out, and the town was in the highest excitement. Flags waved from every window. In one instance the national Italian flag surmounted the old Neapolitan standard, which was hung upside down, and mottoes of "Garibaldi the Good and Brave," "The Liberator of Italy," &c., were observed on every hand.

At the luncheon, which was attended by Messrs. Whitbread (father and son), and all the local celebrities, the Mayor proposed "The health of Garibaldi," expressing the great pride he felt at the honour his visit had conferred on Bedford. Garibaldi said he was much gratified at the opportunity afforded him of viewing the works carried on by Messrs. Howard, calculated, as he could not fail to see they were, to further the improvement of the science of agriculture. Mr. Howard, senior, father of the Messrs. Howard, next expressed his gratitude for the compliment paid to Bedford by the visit of Garibaldi, who had been the defender of liberty throughout his life. He sincerely hoped every happiness might hereafter attend him. After the luncheon Garibaldi and all the company left the Mayor's house for the Hoo Farm, that of Mr. James Howard. On their way it became necessary to pass under a triumphal arch, which spanned the principal street of Bedford, and here the carriages were opened to enable the Mayor to deliver to the General an address voted by the corporate authorities of the town. Garibaldi received it graciously, and bowed his acknowledgments.

On reaching the Hoo Farm, Garibaldi first inspected the homestead and stock, and then mounting a pony, accompanied by the Duke of Sutherland and Messrs. Howard on horseback, and a long cavalcade of carriages and mounted ladies and gentlemen, proceeded to a fallow field of several acres in extent, where Messrs. Howard's steam ploughing apparatus was ready for operation. Garibaldi first examined both the plough and the stationary engine, and, the word having been given to put the machinery in motion, he rode up and down the furrows with the steam plough several times, and then went across again to examine the engine. Returning to the plough, the operations were renewed and kept up for some minutes, and until the General had expressed himself perfectly satisfied. As Garibaldi retired from the field, the assembled crowd of ladies and gentlemen gave vent to their feelings by loud acclamations, which were followed by three cheers for the Duke of Sutherland, in which the ladies heartily joined.

SHORTHORN SALES.

THE CLIFTON PASTURES, AND THE LATE MR. LAWFORD'S HERDS.

Things continue healthy on the shorthorn change. The average of four sales within eight days of each other, in March, was £61 17s. 0d. for 253; and during the past week 161 lots have been sold for £7,879 4s., or an average of £48 13s. 6d. Of these, four males and six females fetched between £100 and £300, and averaged £158.

Mr. Robinson's, of Clifton Pastures, or "Clifton Bins," as they were wont to call it, when Claret was coming up

third in Royal company, contributed the lion's share to this pleasant result, and Mr. Stafford's return was on this wise:—57 cows and heifers at £56 3s., and 15 bulls at £65 0s. 7d., = £4,175 17s., giving an average of £58 within a fraction for the 72. The dashing joint purchase by "the confederates" of Second Duke of Thorndale received its public endorsement in an average of £57 for his 22 calves, which ranged in age from April 7th, 1862, to April 6th, 1864, six of them being dropped within the year. Three out of the eight bulls by him (St. Swithin, Thorndale Troutbeck, and Thorndale Howard) belonged to

Mr. Howard, and they averaged £82 19s. each. Hence we may hardly wonder that another of the family took his own part so spiritedly in the Shorthorn Congress.

The day was most beautiful, and it is calculated that at least 1,600 persons were present, of whom a large portion were bountifully regaled in the old cattle-barn, which hardly knew itself under its weight of laurels. Mr. Charles Barnett was in the chair, and when "The Queen" and "Mr. Robinson" had been duly drunk, Mr. Strafford moved an adjournment to the ring, which was flanked by two haystacks, and surrounded by a very excellent company, both in the general and the auctioneer's sense of the term. The eleven Foggathorpes bore up well for the average, to the tune of £67 4s. Among them, British Beauty, at 85 gs., became Col. Towneley's through the agency of Mr. Culshaw, who had a good set-to with Mr. Tindall, of Wheatley. Roan Duchess, 89 gs., a very fine deep-framed cow, by Third Grand Duke, went to Mr. A. J. Roberts's; and Lady Superior, 72 gs., to Mr. Dodwell, of Bucks; while Forest Queen, a very beautiful Hayman heifer, for which Mr. James Howard would hardly be denied, was purchased by Mr. Strafford for Sweden. Thorndale Duchess, 65 gs., departed to Cheshire at Mr. Davis's nod; and Forester by Composite, a son of Forest Queen's, and the best bull-calf there, to Mr. Balteel, of Cornwall, who recently bought several females at Saraden. The remembrance of her dam helped off the pretty British Belle (Mr. B. Graham, 37 gs.)—one of those Booth-and-Bates blendings, which have always been Mr. Robinson's forte. She was rather more than seven weeks old, and by Second Duke of Thorndale, and therefore people seemed rather surprised that Towneley passed her.

The five Sylphs averaged £62 16s., and Sweetheart 2nd—thirteen years old, and served by the Second Duke of Thorndale on July 20th—made 50 gs., or 20 gs. less than at the sale of Mr. Adkins, who bore her back to Milcote. She was a rare bargain, as her heifer Specimen of full Knightley blood, which came in her from Milcote, was the subject of a spirited competition between Mr. Doig (who bid for Col. Pennant throughout the day), Mr. G. Graham, of Yardley, and Mr. G. C. Adkins, the last-named getting her at 125 gs.

Sylvia Gwynne, for which Mr. Robinson gave 62 gs. at Mr. Troutbeck's sale in 1859, now sank to 35 gs.; but her Golden Gwynne by Mayduke proved the judgment of the purchase, and Mr. James Howard gave 110 gs. for her, after a close run with Mr. Roberts's agent. Thorndale Troutbeck, 81 gs., helped up the average of the three, which composed this tribe, to £79 2s., and goes to Mr. Herriek's, of Grace Dieu.

"The Queens" or "The Princesses" from Snowdrop, and bought in 1839, when Mr. Robinson was on his youthful voyage of discovery to the herds of Great Britain, and lingered at Mr. Crisp's, of Doddington, mustered seven at £49 10s. Queen of Hearts by Mayduke (Mr. Lynn, 65 gs.), Queen of Trumps (Mr. Frere, 61 gs.), and Queen of Airdrie, a very pretty calf (Colonel Pennant, M.P., 61 gs.), were the principal price-makers for the tribe.

Mr. Doig was set upon Junia, 91 gs., who goes back, like the Gwynnes, to a cow by Favourite (252), and realized her cost price at the Aynhoe sale. The biddings were all one-guinea ones, and slowly made, although Mr. Finlay Dunn and Mr. Beasley were pretty pertinacious. Her six days' heifer by The Second Duke of Thorndale made 41 gs.; so much for the value set upon the illustrious deceased, whose name only appeared against seven in the service-list. Jonquil (Mr. Aylmer, 42 gs.) and Just the Sort (Mr. Denchfield, 33 gs.) were doubtfuls; Jessamine went for 44 gs. to Mr. Armstrong, of Huntingdon; and Jezebel for 72 gs., to Sir George Phillips; and thus the six of "Beasley's J sort," as they are popularly termed, averaged £56 10s. 6d.

Fairlight (61 gs.) by Highthorn, and a grand-daughter of Telluria by Orontes, and so back to "No. 4 at the Chilton sale," has been the winner of eight prizes in her day, and goes to try her luck among the Cumberland pastures for Mr. Foster, who has come out very spiritedly of late. Rose of Berrington departed for 56 gs. to Kent; and Claret, another eight-prize winner, and served by Second Duke of Airdrie, tempted Mr. James Howard at 60 gs., and was considered about "the bargain" of the day. Red Hart was rather plain, and therefore even the highly creditable maternity of Revelry did not force her beyond 46 gs., which was given by Mr. Wyland, who bought four or five other lots. Mermaid, a grand-daughter of Cold Cream, and originally bought when very poor from Lord Spencer, had made up well, and Mr. Sheldon would not be denied at 75 gs. Mr. Foster beat off Betts, who was not in his Towneley and Sarsden form), Barclay, and Howard for Revelry, a rare proof of The Second Duke of Thorndale's prowess as a heifer getter; and Nancy Bell (80 gs.), by the same bull from Northern Belle by Highthorn, is a very good accession to the Penrhyn steading.

Mr. Beasley took the heavy-fleshed Second Duke of Airdrie, who had fifteen entries in the bulling-list, at 60 gs.; and the white Cramer went at butcher's price to the butcher. Fifth Grand Duke, who had two calves to speak for him, but is no show bull, just brought back, after nearly two years, the 200 gs. paid for him at the Speke sale; and Mr. Foster completed his trio with Thorndale Howard, a combination of The Second Duke of Thorndale and Marmaduke. Col. Pennant bought four in all; and among the other buyers we may mention Sir C. Mordaunt, Sir G. Phillips, Messrs. D. R. Davies, Nesham, Woodward, G. Bland, Garne, Canning, Ladds, G. W. Roberts, Hosking, Leney, J. Cross, R. Boyes, Hawkes, Cranfield, Cayless, Adcock, R. Wood, and Trotter.

Several of the company were found round Mr. Strafford's ring in the adjacent county, the following afternoon, under an equally fine sky, at Southcott, near Leighton Buzzard, when the late Mr. Edward Lawford's herd was disposed of. It was more of a milking herd, and in nice saleable trim, but not "brought to the post" so well as Mr. Robinson's. Still there was a good average of £38 6s. 6d. for seventy-eight females, and £64 18s. 2d. for eleven bulls, giving a grand total of £3,708 7s., and an average of £41 12s. The attendance fell short of that of Clifton Pastures, although it was large, and the luncheon was presided over by Mr. Bowly. The leading features of the sale were the cracks of the Seraphina tribe, and Imperial Oxford. Seraphina 2nd was knocked down to Lord Southampton, who bought five lots in all, and then there were two grand rallies for the own sisters Seraphina 13th and Seraphina 15th, both by John o' Gaunt. The former was a remarkably level beauty, and third in the yearling heifer class at Battersea. Mr. Holland's agent bid well for her, and at 100 Mr. Barclay began, and Captain Oliver closed with him; but the gallant Scot was victorious, and carried her off at 240 gs. with her Imperial Oxford burden, which dates from August 17th. Mr. Barclay bid again for her sister, as did Mr. A. J. Roberts, Captain Oliver, and Mr. Holland's agent; but Lord Sudely's agent was declared the winner at 160 gs.

The other female lots above 50 gs. were as follows: Goody Gloster (Rev. C. W. Holbeach, 52 gs.), Grand Duchess (Mr. A. J. Roberts, 60 gs.), Clarence (Mr. Noakes, 77 gs.), and Oxygen (Mr. Ewing, 50 gs.). Among the bulls, old John o' Gaunt made 36 gs.; but his young rival, Imperial Oxford by Second Grand Duke from Oxford 13th, caused, as might have been expected, a very obstinate fight among the believers in Bates. After 200 was reached, the Rev. Mr. Jefferson and Mr. Hegu

fought it out up to 300 gs., and the latter, who would have gone on considerably farther rather than lose him as a cross for his Duchesses, was the conqueror. He is a very nice-headed, but not in other points a show bull; and his stock, some of which seemed rather too light in their red, were nothing very remarkable as a whole. Omnibus by John o' Gaunt was knocked down for 77 gs. to the Earl of Derby's agent, and Golden Nugget (51 gs.) to Mr. Cooper, of Halesworth, Suffolk, who bought nine. Mr. Fowler, of the Prebendal Farm, Aylesbury, was also the purchaser of seven lots; the Rev. C. W. Holbeach, Mr. Trotter, and Mr. Noakes, of four; Mr. Holland, M.P., Mr. Mark Phillips, Mr. Snowden, and Mr. A. J. Roberts, of three, and Mr. Fowler and Mr. Sturgeon of two. One lot, Oxygen, went to New Zealand, another to Canada, and several to Norfolk.

THE DUBLIN HORSE SHOW.

PRIZE LIST.

Thorough-bred Stud Horses, best calculated to improve and perpetuate the breed of sound and stout thorough-bred horses, weight-carrying hunters, and horses for general stud purposes—First, J. T. Dillon (Wild Irishman); second, Lord Powerscourt (Schamy).

Sires got by a thorough-bred horse, or out of a thorough-bred mare; or thorough-bred horses for covering half-bred mares at two sovereigns each, calculated to get troopers or riding horses—First, Charles M. Wright (Barleux); second, W. S. Atkinson (Sir Isaac).

HUNTERS.

Weight-carriers, equal to 14 st. 7 lbs. and upwards.—No merit.

Weight-carriers, from 13 st. to 14 st. 7 lb.—First, Captain John Coddington, A.D.C. (Rust); second, Lieut.-Col. Brown (Weasel); highly commended, Henry Murray (Frank).

Weight-carriers from 12 st. to 13 st.—First prize withheld; second, Lieut. Clement Bond, 36th Regt. Jonathan Bruce (Dandy Jim) medal.

Three-year-old Colts or Fillies—First, Sir Percy Nugent (cheatnut colt); second, no merit.

LADIES' HORSES, PARK HORSES, AND COBS.

First, His Excellency the Lord-Lieutenant (Helena); second and medal, Mr. Thos. Cranfield (Kitty); highly commended, Miss Flood (Dhucia).

Weight-carrying Cob, from 14 to 15 Hands.—First, Mr. Michael Cashman, and Marquis of Conyngham's gold medal; second, Mr. John Nagle (Bob); highly commended, Mr. Allan Pollok (Nelly); commended, Lord Crofton (Judy); Mr. W. H. McGarry (Little Bob); General Sir George Browne (St. Jacques), medal for most quality and action.

Pair of Match Carriage Horses, Mares, or Geldings.—First, His Excellency the Lord Lieutnant and two medals.

Brougham Horses, Mares, or Geldings.—First, Captain Morton (Sampson); second, no merit.

OFFICERS' CHARGERS.

Section 1. First Chargers: First, Captain the Hon. C. C. Molyneux, 10th Royal Hussars (Phoenix); second, P. J. Williams Buckeley, 10th Hussars (Singapore). Captain Whinnyates, R.H.A., Royal Barracks, Dublin (Rouge-et-Noir), medal for quality and action.

Second Chargers: No appearance.

HORSES CALCULATED FOR TROOPERS, FROM 3 TO 5 YEARS OLD.

No award.

BROOD MARES.

Thorough-bred Mare, calculated to perpetuate the breed of sound and stout thorough-bred horses for general stud purposes: First, Earl of Howth (Foinnulla); second, W. Quinn (Attraction); commended, Captain Walter Nugent (Crystal). Mares for breeding purposes up to 14 stone: First, Mark Leonard (Veritas); second, George White West (brown mare).

Mare for breeding purposes up to 12 st.: First, and gold

medal, William Stowell Garnett (Bobbing Round); second, Walter Rickard (Molly).

PONIES.

Ponies from 12 to 13 hands.—First, Robert Thomas (chestnut mare); second, Master William Dunbar (Waxy).

Ponies under 12 hands.—First, P. Taaffs (Bunty); second, Robert Orme (Cook Robin). J. C. Metge (Bob), medal for smallest pony exhibited.

The judges were—For sires and thorough-bred mares, Colonel Cotton, H. Briscoe, and Richard Barnard.

Hunters.—Major Ellis, Captain Croker, and William Clarke. **Hunters from 12 to 13 stone, and three-year-old colts and fillies, J. L. Naper, Charles Garfit, and Mr. Payne.**

Ladies' horses and weight-carrying cobs.—Marquis of Downshire, Lord James Butler, and Colonel Baker, 10th Hussars.

Carriage and brougham horses, and ponies.—Lord Crofton, Henry Meredith, and R. Fetherston.

Mares for breeding purposes, not thorough-breds.—Lord Charlemont, Sir Percy Nugent, and Hon. E. Lascelles.

Officers' chargers.—General Key, Col. Hillier, and Capt. Carnegie.

Troopers.—General Key, Col. Philpotts, and Capt. Carnegie.

GARIBALDI'S VISIT TO THE ROYAL FARMS AT WINDSOR.

General Garibaldi, accompanied by the Dowager Duchess of Sutherland and the Duchess of Argyll, drove from Cliefden to Windsor on Saturday, for the purpose of viewing the Royal farms in the park. The General and party were received by Mr. Tait, the bailiff, at the Show Farm, who took them over the buildings and grounds, explaining, as they went on, the various arrangements. The beautiful dairy of the Queen at Frogmore was next visited, and, in turn, the Royal gardens, under the conduct of Mr. Ingram, the head gardener. Mr. Tait then resumed the guidance of the party, which drove to the Flemish farm, and saw the many interesting objects and arrangements by which the late Prince Consort succeeded in making this farm a model of its kind. A good-looking Hereford bull that has for some time past borne the name of Garibaldi was honoured by a very careful inspection from his distinguished namesake, and the white-face will go on to Newcastle, already as something of "a lion" in his way.

A still more interesting sight was Fowler's steam plough in work, near the Cavalry Barracks at Spital, under the direction of Mr. Steevens of Hammermith, who came down specially on the Friday to superintend the operation. Mr. Steevens had not only the pleasure of demonstrating the many merits of Fowler's famous plough to the General, but also of explaining the principle of his own new patent plough, which it will be remembered made so strong an impression at Worcester. The illustrious visitor, seated in the chair-cart of Mr. Brebner, evinced the greatest interest in all that was going on, although he was perhaps scarcely prepared for the offer made by Mr. Steevens, on the part of the farmers of the neighbourhood, to present the General with a complete set of steam plough tackle. In gratefully declining this handsome testimonial, Garibaldi said that his farm at Caprera did not include above forty acres of arable land, the remainder being of a mountainous character; so that he should really have no proper use for such an implement. The visit, by the particular desire of the Duke of Sutherland, was kept very private, and not more than a dozen farmers were present.

THE METEOROLOGY OF APRIL.

The month of March closed with somewhat cold weather, the mean temperature for the four days March 27th to 30th being defective to the mean amount of 4.7°. These four days were generally cloudy throughout, and of a somewhat unpleasant nature, owing to the prevalence of brisk winds (into whose composition a northern current more or less entered), and whose unpleasant effect on the 28th was enhanced by the occurrence of frequent smart showers (especially at evening) of hail and rail, which fell together to the amount of 0.10 inch; on the 29th hail fell for a few minutes about noon; whilst on the 30th snow fell thickly during the early morning hours, and occasional showers of rain during the day, the total fall amounting to 0.19 inch.

On the night of the 28th the minimum reading of the barometer was observed, namely, 28.9 inches, and the readings of the barometer then generally increased till the 31st of March, when a slight decline was experienced to the amount of about one-sixth of an inch, and the rise then continued with but slight fluctuations till the 8th of April, when the maximum value of 30.24 inches was reached. During the first portion of this increasing atmospheric pressure, the weather greatly improved, and less cloud being present, the day-temperature increased in amount, but the nights still continued cold, and the mean daily values consequently received but slight augmentation, the values for the 31st of March and the 1st of April exceeding their corresponding averages by trivial amounts only. A still greater freedom from cloud on the 2nd, producing as it did a far greater degree of cold by night (as evidenced by the thermometer on grass, which fell to 23°), again caused a deficiency in mean temperature to the amount of 2°. The rapid motion of the wind also, following so many days, on which the air had been in generally brisk motion, produced an extraordinary degree of atmospheric dryness, and the degrees of humidity for the 1st and 2nd of April were respectively 66 and 67.

The few following days afford a striking instance of the great influence exercised by the wind upon the temperature of the air. On the 3rd, a S.W. wind prevailed, and the mean temperature of the day increased somewhat, so that it scarcely differed from its average; and on the following day, with S.W. and N.W. winds, the temperature rose to 61½°, and the mean for the day, namely 53.3°, exceeded its average by no less an amount than 8½°. On these days the sky was entirely overcast, with clouds. But on the 5th day the wind blew from a quarter almost diametrically opposite to the former, and a surprising difference in temperature was experienced—the highest point on this day having been 41½° only (differing from that of the previous day by 20°), and the mean for the day, namely 36.8° (16½° lower than on previous day), was, consequently, 8½° less than the average value. The circumstances of this day did not differ in any respect from those of the former, with the exception of a constant fall of rain to the aggregate amount

of half-an-inch. The 6th, 7th, and 8th were also cold days, with the wind still blowing from the E., or one of its component directions, and although they continued cloudy, they were generally fine. The mean deficiency of temperature for these three days amounted to 2.4°.

With the 9th day commenced a fine period of almost unprecedented character for the month of April. From that day to the end of the month, a period of 18 days, the weather continued fine without intermission, rain falling on one day only, namely, on the 16th, and then to the amount of only 0.06 inch. On several days during this period the sky was entirely, or almost entirely, free from cloud—namely, on the 13th, 14th, 19th, 20th, 21st, 22nd, and 23rd, and the solar radiation thermometer reached high readings—of 118° on the 23rd, 111° on the 22nd, and about 105° on the 15th, 20th, and 21st.

The earth at night also gave out its heat freely, and the thermometer, placed on the grass with its bulb exposed to the sky, gave the following readings—on the 23rd, 23°; on the 13th and 14th, 25°; on the 22nd, 26½°; and on the 14th, 25°; whilst the thermometer for the ordinary minimum temperature on the same respective days gave 35½°, 33½°, 36°, 39°, and 36½°, indicating differences due to the two positions of from 8° to 12°. The warmest day of the period was the 20th, when the temperature rose to 74°, and the mean for the day (60.2°) exceeded its average value by 13½°. Next followed the 19th, with an excess of mean temperature of 9½°; then the 11th, 8°; the 21st, 7½°; and then the 15th, with 7°. Many days of the period were excessively dry; for instance, the 20th, with a degree of humidity of 50°; the 19th, 53°; and the 21st, 57°. The barometer during the greater part of the period remained steady at a high point, and still remains so at the present time, but now appears likely to turn to fall at an early period.

Glancing over the tables of results, we readily find that the highest reading of the barometer occurred on the 8th of April, and was 30.24 inches: the lowest was 28.93 inches on the 28th of March, giving a range for the month of 1.3 inch. The highest temperature in the shade was 73.8° on the 20th of April, and the lowest 28.9° on the 27th of March, and the range consequently amounted to 44.9°. The highest reading in the rays of the sun was 118° on the 23rd, and the lowest on the grass was 22° on the 27th and 30th of March. The dampest day in the month was the 16th; the driest was the 20th. The total amount of rain collected from the 27th of March to the 26th of April was 1.1 inch—an extremely small amount, and which fell on six days only.

The past month therefore has been remarkable for its extremely fine character; and I may add, that such weather during the month of April is perhaps altogether unprecedented. Its only drawback has been the insufficient quantity of rain, which may perhaps prove somewhat prejudicial to the growth of grain sown in light dry soils, but scarcely so to that sown in heavy damp grounds.

METEOROLOGICAL ELEMENTS FOR THE NEIGHBOURHOOD OF LONDON;

FROM MARCH 27TH TO APRIL 26TH, 1864.

Month and Day.	Temperature of the Air in Shade.			Highest Reading of a Thermometer in the full Rays of the Sun.	Temperature of Vegetation.*	Degree of Humidity. (Saturation=100).	Amount of Cloud, 0 to 10.	Amount of Rain.	General Direction of the Wind.	Weather Remarks.
	Highest	Lowest.	Mean.							
1864.	°	°	°	°	°			Inches.		
Mar. 27	47.4	28.9	38.1	80.3	22.0	69	7.7	0.00	N.N.W.	Fine; cloudy
28	47.8	34.9	41.1	58.0	28.7	73	10.0	0.10	SW., NW.	Overcast; rain and hail
29	49.7	33.2	39.2	87.0	28.0	73	7.3	0.00	N.W.	Cldy. day; clr.nt.; little hail
30	47.4	31.8	38.2	52.0	22.0	88	10.0	0.19	SW., NW.	Overcast; snow and rain
31	53.6	32.7	44.3	83.0	23.1	86	9.3	0.00	S.W.	Variable; thin rain
April 1	53.0	39.1	43.8	88.0	33.0	66	6.3	0.13	W.S.W.	Cloudy; rain and a little hail
2	54.4	33.8	42.1	82.5	22.9	67	4.5	0.00	WSW.NW.	Fine; cloudy day; clr.night
3	49.7	36.9	44.1	55.6	27.2	93	10.0	0.00	S.W.	Generally overcast
4	61.4	47.9	53.3	76.5	45.5	84	9.8	0.00	SW., NW.	Generally overcast
5	41.4	35.3	36.8	46.5	33.1	88	10.0	0.56	E.N.E.	Overcast; rain and sleet
6	48.5	35.0	41.2	83.7	34.5	87	10.0	0.07	SE., NNE.	Overcast; rain
7	51.8	39.4	43.6	82.0	37.3	73	9.0	0.00	NNE., SE.	Generally cloudy
8	54.7	37.9	44.4	101.1	33.7	62	6.8	0.00	S.E.	Fine; cloudy
9	57.3	37.4	47.9	75.0	33.0	81	10.0	0.00	SW., NW.	Cloudy; fine
10	58.5	46.3	51.1	78.7	44.0	81	6.7	0.00	variable	Partially cloudy
11	63.3	44.0	53.1	86.4	35.7	78	8.0	0.00	SW., NW.	Lht.clds.prvid.; slht.fog nt.
12	60.1	40.9	48.1	96.6	32.6	70	2.5	0.00	N., E.	Lht.clds.prevalled generally
13	54.2	33.4	44.3	93.0	24.9	73	0.0	0.00	E.	Cloudless; slight haze
14	56.5	36.6	46.2	95.3	28.0	73	0.0	0.00	E.	Fine; few clouds
15	68.5	36.9	52.8	104.6	34.2	61	4.0	0.00	S.E., S.W.	Few lht.clds.day; ovrcst.nt.
16	51.5	44.8	46.9	57.2	39.3	95	10.0	0.06	SW.,WNW.	Overcast; a shower of rain
17	60.7	41.2	48.9	95.0	30.6	71	2.7	0.00	N.N.W.	Fine; light clouds
18	65.0	38.2	51.1	100.0	25.5	68	2.3	0.00	S.W., S.	Few light clouds; fine
19	68.0	42.1	55.9	103.6	30.0	53	0.0	0.00	S.	Cloudless; a fine day
20	73.8	45.8	60.2	105.0	37.0	50	0.0	0.00	S.S.E.	Cloudless; a fine day
21	67.2	46.0	54.6	105.5	33.4	57	1.0	0.00	S.E., E.	Generally clear
22	62.9	39.2	51.1	110.5	26.5	66	0.0	0.00	ENE.ESE.	Cloudless
23	66.4	35.5	51.5	117.8	23.3	70	0.0	0.00	N.E., S.E.	Cloudless
24	55.0	39.2	45.5	85.0	32.5	75	7.0	0.00	N.E., S.E.	Generally cloudy
25	59.2	37.7	48.0	103.6	29.2	72	3.7	0.00	S.E., N.E.	Partially cloudy
26	56.9	40.0	48.0	69.1	32.0	73	8.8	0.00	N.E.	Cloudy

* The "temperature of vegetation" is that obtained from a self-registering thermometer placed on the grass at night. It is therefore a minimum reading for the previous twenty-four hours.

TABLE SHOWING THE PRINCIPAL FLUCTUATIONS IN THE ATMOSPHERIC WAVE, FROM MARCH 27TH TO APRIL 26TH, 1864.

1864. Month, Day, and Hour.	Reading of Barometer.*		1864. Month, Day, and Hour.	Reading of Barometer.*	
	Highest.	Lowest.		Highest.	Lowest.
	Inches.	Inches.		Inches.	Inches.
Mar. 27, 9 a.m. ..	29.45		April 8, 9 a.m. ..	30.24	
„ 28, 9 p.m. ..		28.93	„ 15, 3 p.m. ..		29.54
„ 29, 9 p.m. ..	29.38		„ 16, 9 a.m. ..	29.59	
„ 30, 9 a.m. ..		29.35	„ 16, 3 p.m. ..		29.54
„ 31, 9 a.m. ..	29.67		„ 18, 9 a.m. ..	29.95	
April 1, 3 p.m. ..		29.50	„ 19, 9 p.m. ..		29.79
„ 2, 9 p.m. ..	29.85		„ 23, 9 a.m. ..	30.10	
„ 3, 7 p.m. ..		29.71	„ 23, 3 p.m. ..		30.06
„ 5, 9 p.m. ..	30.13		„ 24, 10 a.m. ..	30.10	
„ 6, 3 p.m. ..		30.06	„ 25, 3 p.m. ..		29.98

* All the readings are reduced to the constant temperature of 32 degs.

CALENDAR OF AGRICULTURE.

The planting of beet and potatoes must now be finished: horse and hand-hoe all drilled crops—allow not a single weed to be seen.

Turn-over the heaps of winter-heaped dung, when the fermentation will readily commence, and during its progress place the dung in drilled lands of ridgets, which is immediately reversed, and sown with the seeds of Swedish turnips, the seeds being placed in a near contact with the warmth of the fermenting dung. In the first place sow green-topped swedes, then Laing's and Watson's hybrids; and follow with Aberdeen yellows. In dry weather roll the drills immediately: in moist and showery weather it may not be required.

Plant cabbages, kohl rabi, Savoys, and winter brocolis from the seed beds, on drills three feet apart, and the plants two feet asunder in the drills. Apply wet half-rotten farm-yard dung in a large quantity on strong lands that are too stiff for turnips, and dibble the plants into the ground in the wettest weather in which work can be performed, as the vegetables require much moisture. Fill all blanks with fresh plants, in order to obtain an even crop on the ground. Sow early turnips for a feeding crop, as tankards and whites, and sow rape to be consumed on the ground, as preparatory for wheat.

Pare and burn all rough surface lands, and spread the ashes to be cooled. Prepare with a most busy attention the fallows for green crops, and also clay-land fallows for wheat.

Stall-fed cattle will now be disposed of—the fat ones to the butcher, and the leaner will go to the pasture fields, to be fattened on grass. The milch cows are sent to the pasture field for the special purpose, adjacent and convenient, provided with water and shelter, and improved with frequent

top-dressings and the sowings of clovers and of strong perennial grasses. The oldest calves will go to the grass paddock, and if the grass be scanty, a supply of clovers and vetches is placed in racks for their use. A supply of water and of a shelter-shed is indispensable.

The latest lambs require much attention, and must have the best grass pasture on the farm, to raise the animals to an equality with the foremost in age. An equality of stock very clearly shows the skill and management that are employed in the breeding and condition of the existence.

The ewes and lambs that are consuming vetches and rye on the ground, must have fresh food every two days. Begin the soiling of horses and of cattle in the yards, and also the milch cows, if the pasture is not abundant. Feed the store pigs with clovers and vetches, and afford ample littering to all animals. As the early soiling green crops are consumed, plough the land for turnips.

Put mares to the stallion, and geld colts, which would be better done in the previous autumn.

Finish the sowing of grass seeds on barley tilths. Sow by machine, and cover with light harrowing and heavy rolling.

Dig hop plantations, and tie the bine to the poles. Shut up water-meadows for hay.

Wash sheep by hand in a clear running stream, and for preventing 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 $\frac{1}{2}$ lb. to $1\frac{1}{2}$ lb.

Weed young thorn hedges, but not to expose the roots to the hot sun in dry situations. Rather leave the weeds to moisten the roots, provided the upward growth be not checked.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Commence with sowing dwarf kidney beans for a full crop in July. Repeat in the third week.

The scarlet and variegated runners also, with a layer of moist mizen dung, in a shallow trench a few inches below the surface. Then turn the soil over the manure, press it moderately firm, and sow about three inches below the upper surface level, covering to the depth with light earth. The dry and searching weather in May and June will show the benefit of this method, as the plants will seldom flag. Sow cucumbers on a ridge over manure. Repeat all the sowings of last month, in order to afford the regular supplies. The tap-rooted plants are omitted. Sow dwarf Indian corn about the 15th. Allow not any weeds to grow, and

where there is time, Dutch-hoe and finely rake every portion of uncropped land: the extreme neatness will amply repay the trouble.

FLOWER GARDEN.

Remove all fallen leaves to the compost heap eradicate all suckers, dress shrubs, roll gravels, and lawns to be mown.

Sow annual seeds in borders, propagate by slips and cuttings the wall flowers and rockets, and place a glass over the plants.

Roses must be watched and cleared from the worms. Stir the surface of grounds when nearly dry after heavy rains—hoe and rake neatly.

Attend to give air and water to any plants under glass.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR
APRIL.

Notwithstanding that very little rain has fallen in any part of England during the month, our advices in reference to the general appearance of the wheat crop are very favourable. The plants are even, strong, and healthy; whilst they are quite as forward as in the general run of years at this period. The fine appearance of the wheats, the large quantities of grain still in the hands of our farmers, and the excellent condition in which the samples continue to make their appearance, have had a depressing influence upon the wheat trade. The fall in prices has been confined to about 2s. per qr.; but the impression amongst the buyers is that, although the quantity of produce now on passage to this country is small, the currencies have not seen their lowest range. The large purchases of wheat effected in the early part of the year—about 500,000 quarters—for forward arrival from the Black Sea ports have, no doubt, had considerable influence upon the trade; nevertheless, we may assume that there is very little prospect of any improvement in it for a considerable period. An advance of a few shillings in the value of wheat would be speedily followed by heavy importations from France, the United States, &c.; consequently, large additions would be made to the stocks in warehouse.

The malting season having been brought to a pretty general close, fine barley has moved off heavily, at 1s. to 2s. per quarter less money, and all other kinds have changed hands slowly, on easier terms. The supply of malt on hand being unusually large, that article has given way 2s. per quarter, with a heavy demand. The consumption of beer in this country, however, does not appear to have fallen off.

Oats, though in fair average supply, have commanded rather more attention, at full prices.

Both beans and peas have realised quite as much money as in the previous month, and the demand for them has been moderately active.

Very little change has taken place in the value of either English or foreign flour. The trade has been wholly restricted to immediate wants.

Letters from most of the continental and American markets are to the effect that wheat, which has appeared in full average supply, has commanded rather more money. It is understood, however, that the supplies in stock are considerably in excess of the two previous years; consequently, the surplus quantity must tend to check any important upward movement in value.

Great activity has continued to prevail in the demand for all kinds of wool. A portion of our new clip, which is turning out large, and of excellent quality, has already passed into the hands of the manufacturers, at unusually high rates. The forthcoming series of colonial wool-sales, to be held in London, are, therefore, looked forward to with a considerable amount of interest. During their progress, 90,000 bales will be offered, and higher quotations for most kinds are generally anticipated. The shipments of woollen goods during the first three months of the present year were unusually large, arising, in a great measure, from the high range in the value of cotton, and the moderate stocks on hand. The state of the foreign markets and the high prices realized for goods, both at home and abroad, indicate considerable firmness in the wool trade for some time, even with a high range in the value of money in the general discount market.

Unusually large supplies of potatoes still continue on sale in the various markets, in good condition; and we understand that the stocks on hand in most parts of the United Kingdom are very extensive. The trade, therefore, has been in a depressed state, at from 40s. to 90s. per ton. The imports from the continent have exhibited a great deficiency,

when compared with some former years. The low figures ruling here have, no doubt, induced the foreign growers to withhold their usual supplies.

The quantity of hay in stock is now greatly reduced; but, for the most part, its quality is very good. The demand has improved, and the currencies have had an upward tendency. Meadow hay has realized £3 to £4 15s.; clover, £4 to £5 15s.; and straw, £1 4s. to £1 15s. per load. The prospects of the next crop of meadow and clover hay are highly favourable. Rain is now much wanted to force on the crops; but the fields have quite as much grass in them as in the general run of years.

The quantity of land under wheat tillage in America is represented as smaller than at any time during the last ten years. The falling-off in the cultivation of wheat has arisen from the great scarcity of labour, and the high prices demanded for it. The unhappy struggle in the South has, therefore, produced evils of no ordinary character for the agriculturists. The American wheats at hand of late have been very foul—consequently, worth less money by 2s. to 3s. per quarter than if they had been shipped in a clean state.

The Scotch markets have been but moderately supplied with wheat; nevertheless, all kinds have sold slowly, and prices have been with difficulty supported. With the exception of barley, which has given way about 1s. per quarter, nearly all other descriptions of produce have commanded full prices.

In Ireland, the markets have continued in a most inactive state. Wheat, barley, meal, and flour have sold on lower terms. In the value of other articles, no change of importance has taken place. The shipments to England have been very limited.

REVIEW OF THE CATTLE TRADE DURING THE
PAST MONTH.

The Metropolitan, as well as most of the local markets, have been seasonably well supplied with beasts, which, for the most part, have come to hand in good saleable condition. The demand for most breeds, owing to the large supplies of meat on sale in Newgate and Leadenhall, has been less active than in the previous month; nevertheless, the quotations have been fairly supported, really prime Scots and crosses having realized 4s. 10d. to 5s. per 8lbs. Both the Norfolk and Scotch beasts have turned out remarkably well, and have carried quite an average quantity of internal fat. The supplies on hand ready for consumption are quite equal to last season.

The sheep have made their appearance in fine condition, and fully five-eighths of them have been out of the wool. Although the numbers have increased, the mutton trade has been somewhat active, at very full prices. Downs, in the wool, have realised 5s. 10d. to 6s.; out of the wool, 4s. 8d. to 4s. 10d. per 8lbs. It will, therefore, be seen that there has been a margin of 1s. 2d. per 8lbs. between the various quotations. This wide difference must be solely attributed to the high range in the value of wool, arising from the great activity in the trade.

Full average supplies of lambs have been brought forward in fair condition. The lamb trade has not been so active; but prices have fluctuated considerably—viz., about 8d. per 8lbs. The latest quotations realized in the London market were from 6s. 4d. to 7s. 8d. per 8lbs.

The supplies of calves have been chiefly composed of the arrivals from the Continent. On the whole, the veal trade has continued steady, at full prices.

As is usually the case at this time of year, pigs have commanded very little attention; nevertheless, the currencies have ruled tolerably firm. The arrival of pigs from abroad has rather increased.

Advices from Lincolnshire, Leicestershire, and Northamptonshire state that the stock is doing well, and that very few

losses have, as yet, been sustained by disease. We may, therefore, look forward to good supplies from those quarters during the last six months of the present year.

The large supplies of rough fat, consequent upon the prime condition in which the stock has come forward, have produced considerable heaviness in the demand. The quotation has fallen to 2s. 1d. per 8lbs. The supply of tallow in warehouse is in excess of last year.

The imports of foreign stock into London have been as follows:—

	HEAD.
Beasts	4,673
Sheep	9,532
Lambs	6
Calves	947
Pigs	284
Total	15,443
Same time in 1863	16,031
" 1862	9,616
" 1861	11,119
" 1860	10,489
" 1859	8,838
" 1858	5,998
" 1857	4,814
" 1856	1,924
" 1855	4,283
" 1854	4,760
" 1853	14,787

The total supplies of stock, including the foreign arrivals exhibited in the Great Metropolitan Market were:—

	HEAD.
Beasts	21,200
Cows	497
Sheep and Lambs	107,010
Calves	1,596
Pigs	8,100

COMPARISON OF SUPPLIES.

April.	Beasts.	Cows.	and Lamba.	Calves.	Pigs.
1863.....	19,290	491	113,060	1,341	2,540
1862.....	19,000	515	110,500	1,077	3,055
1861.....	17,140	510	102,630	497	2,662
1860.....	18,512	489	114,450	1,848	2,140
1859.....	16,850	390	110,114	420	1,990
1858.....	17,950	400	104,380	1,332	2,097
1857.....	18,601	460	92,810	1,240	2,025

The comparison of the arrivals of English, Scotch, and Irish beasts stands thus:—

	April, 1862.	1863.	1864.
Norfolk, Suffolk, &c.....	11,600	12,590	11,350
Other parts of England	3,300	2,800	3,860
Scotland	1,800	1,920	1,114
Ireland	815	45	430

Beef has sold at from 3s. 4d. to 5s., mutton 3s. 8d. to 6s., lamb 6s. to 7s. 8d., veal 3s. 4d., to 5s. 6d., and pork 3s. 6d. to 4s. 6d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	April, 1860.			April 1861.		
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef.....from	3	4 to 5	0.....	3	4 to 5	0
Mutton	3	8 to 5	10.....	3	6 to 5	10
Lamb.....	5	6 to 7	8.....	6	4 to 7	8
Veal	4	8 to 6	0.....	4	8 to 5	8
Pork	3	6 to 4	10.....	3	10 to 5	0
	April, 1862.			April, 1863.		
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef.....from	2	10 to 4	4.....	3	2 to 4	10
Mutton	3	2 to 5	8.....	3	6 to 5	8
Lamb	6	6 to 8	0.....	6	8 to 8	0
Veal	3	10 to 5	4.....	0	to 5	4
Pork	3	8 to 4	10.....	3	4 to 4	6

A large business has been passing in meat in the dead market. Prices, however, have ruled low. Beef has sold at from 2s. 8d. to 4s. 2d., mutton 3s. 4d. to 4s. 6d., lamb 5s. 8d. to 6s. 8d., veal 3s. 10d. to 4s. 8d., and pork 3s. 2d. to 4s. 6d. per 8lbs., by the carcass. The arrivals from Scotland and the North of England have been very extensive.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ATHERSTONE FAIR.—There was a good supply of fat and store stock, which met a ready sale at good prices. There was a very good attendance of both buyers and sellers.

BANBURY FAIR.—The second of the fortnightly fair was well supplied with stock, both in the beast and sheep market, especially the first. At the same time, though the show of stores comprised a good many beasts of superior quality, there were very few that could properly be called fit cattle. Trade both for cattle and sheep was brisk, and prices continued dear. Beef fetched from 3s. 6d. to 4s. 10d., and mutton in wool from 5s. to 6s. the 8 lbs.

BEDFORD FAIR.—There was a large number of store cattle, Shorthorns, and Scotch, with some Welch. Trade was good, many of the beasts going off at prices considered too dear for fattening, some fine rising three years old; store beasts made from £14 to £16 each, rising two years old £10 to £12, storks £6 to £8. Best cows near calving sold at from £10 to £21 each, second-rate £17 to £18, heifers £15 to £17, barren cows £14 to £16; calves weaned from 15s. up to 40s. each. Fat beast in short supply; the demand for these in the field was brisk, at full 5s. per 8lbs. The sheep passed were half-bred, Hants, and Oxford Down, with some large Leicester; prices were above those made at other fairs during the last fortnight; there being every prospect of an abundant supply of grass keep, induced graziers to increase their feeding stock. Best down tegs sold at from 60s. to 5s. each, second quality 40s. to 45s., couples from 60s. to 70s., weaned lambs from 15s. to 21s. Fat sheep in their wool made from 8d. to 8½d. per lb., shorn 7½d. to 8d. There was a fair show of cart nags and gig horses. Cart horses selling at from £30 to £40 each, best warranted saddles and chase horses from £35 to £45, inferior ditto £25 to £30, colts £15 to £20. Very few second-rate or aged horses found buyers.

BLAIRGOWRIE FORTNIGHTLY MARKET.—Two very fine stots were sold for £63, three at £20 each, four at £20 15s. each, and six at £20 each. Mr. Geo. Howison, Raanagullion, sold to the same purchaser two cows for £40; Mr. Andrew Fell sold eight stots and queys at £20 each; Mr. Duff, Thyfarm, sold six stots at £17 each, &c. Scotch Burnside, sold three stots at £17 7s. 6d. each, &c. Several fine lots were taken home unsold. The top price may be quoted at 10s. per Dutch stone, current prices 9s. 9d. and under.

BRECHIN FAIR.—The cattle brought to this market are principally grazing. The show was good, and we believe that better cattle have not been seen in the market for a considerable number of years. As dealers were asking high prices, very few transactions took place until the early part of the forenoon. The market on the whole, however, was considered stiff, and at the close one or two lots were turned off unsold. Of fat cattle there was not a large show, but all were sold at good prices. One fine lot of sixteen three-year-olds was bought at £25 a-head. Prices ranged from 9s. to 10s. 6d. per stone. Lean cattle sold at from £10 to £17, and in many instances the leanest brought as good prices as those which were in better condition. Of sheep no transactions took place worthy of notice. The show of horses was small, but good. Mr. James Macfarlane, Dundee, who had a fine lot, sold two draught horses at £35 each, and a pony at £24.

CARLISLE FAIR.—A large supply of cattle. There was a large show of milch and calving cows, which sold at prices ranging from £9 to £16, and in one instance £18 was obtained. Ayrshires sold at £9 9s. to £12 12s., and £14 a head, £16 being obtained in one instance. The price for Galloways ranged from £10 to £12 and £14. Highlanders £7 to £9. Irish very scarce. On the whole, all kinds sold at extremely high rates. There was a small supply of sheep. Half-breds 40s. to 44s., and for picked lots 50s. a head. Cheviots 25s. to 30s. per head.

CLENT HOLY CROSS FAIR was well supplied with all kinds of stock. Fat cows met a steady sale at high prices; cows and calves sold well, barrens from £12 to £16; fat sheep reached in the wool 9d., couples 6s. to 70s. Some good horses were exhibited, and all sold at from £16 to £40. Store pigs were readily bought, and were considered by all parties very dear.

COVENTRY FAIR.—The supply of beef was somewhat

short, but there was a tolerable good quantity of sheep, as also a number of store pigs. Trade was brisk at the following prices:—Beef 7d. to 7½d., mutton 6½d. to 7d.

DEVIZES FAIR was not very fully supplied. Trade, however, ruled very dear, and everything of value readily met with a sale. Fat beasts there were none, but working oxen fetched from £18 to £28 each; heifers, from 15 to 20 gu.; yearlings from £10 to £12. One fine lot of yearling steers were sold by Mr. Shepherd of Roundway for £14 each, and resold by the purchaser at an advance on this price. Sheep were in very short supply, so much so that many of the dealers could not get the opportunity of making a bid for a lot. Couples made from 52s. to 60s., and tegs 28s. to 44s.; everything being cleared off. The horse fair was as usual a rough lot, and quiet trade.

DOWNTON FAIR.—There was a large supply of sheep, and the trade was brisk. The advanced prices of Weyhill were maintained, 60s. to 63s. the head being no uncommon price. Cattle also sold well and dear, and pigs advanced in price. At Devizes cattle fair there was but a small show of sheep, but the trade was brisk, and prices advanced a little; couples 60s. to 68s., tegs 35s. to 48s. A clearance was soon effected. The supply of cattle was quite an average one, and prices were very firm. Oxen made as high as £60 the pair, grassers from £18 to £17 the head; milch cows £20 to £22, The horse fair was well supplied, but the trade was heavy.

EASTGRINSTEAD FAIR.—There was a moderate supply of stock, which sold at high prices. Good qualities found ready buyers, but young stock did not go off so brisk. There were plenty of buyers, but the prices being high, sales, except for superior qualities, were dull. The supply of sheep and pigs was larger than usual. Some tegs fetched 40s., and the prices for ewes and lambs ranged from 45s. to 50s. The pigs fetched high prices. There was a very dull sale for horses, of which there was a good number present.

HOWDEN FAIR.—The quantity of cattle offered for sale was thought by some to be the largest they had ever seen at Howden. Prices generally were low. Good milch cows sold at £16, but inferior ones could be purchased much under the prices which lately ruled.

LAUNCESTON FAIR was moderately supplied with cattle and sheep. The demand for grazing stock was somewhat checked in consequence of the dry and cold weather, grass being very scarce, and roots and hay generally nearly finished. However, ultimately a vast number of cattle were sold, and by noon all of the first class had changed hands at high prices, £12 each being the general price for poor cows, and from that figure to £26 each for steers and oxen. The show of good fat bullocks was very short, about 3 gu. per cwt. being the price, while anything out of the common order commanded a few shillings per cwt. more money. Sheep in the wool 8½d. per lb.; couples from 50s. to 60s., but not a brisk sale.

LINLITHGOW FAIR.—Contrasted with last year, grass beasts over the general market would be up £1 a-head, and a complete clearance effected. The demand for milch cows was stiff, and prices nominally unchanged.

MUIR OF ORD MARKET.—There was a great number of sheep on the ground. The prices were up from 2s. to 3s. on blackfaced and Cheviots. There were a large number of dealers present, and wool was in great demand. Throughout the day a large amount of business was transacted, particularly in half-breds. Cheviot ewes and lambs brought high prices, but the number of these was limited. The market was generally considered one of the best that has been held for months past. At the cattle market the turn out was very large. The stock generally consisted of crosses, there being a smaller number than usual of Highlanders. As a general rule the quality was very considerably above the average. Sales were brisk in the early part of the day, but towards the middle and close of the day bargains were fewer. Many of the principal southern dealers were present, and bought large quantities considering the high prices asked. The market was, on the whole, a good one. Good fat was fully above 60s.

NEWBURY FAT CATTLE MARKET was not large, with a middling trade. The stock of sheep was, both as to quantity and quality, very good, and the greater part sold at full prices. We may congratulate the promoters on the success of their project.

OAKHAM FAIR.—There was but a small show of fat

cattle. The trade was lively, with an advance in prices. The high price of wool caused hogs to be sought after.

PENRITH FORTNIGHTLY MARKET.—The show of all kinds of stock was again limited. Sheep moved off steadily, but prices presented no material alteration. The average quotations for beasts were 28s. to 30s. per stone, and for sheep 8½d. to 9d. per lb. A good clearance was made.

SHIPSTON-ON-STOUR FAIR was undoubtedly the best and largest fair known here for many years. Sheep arrived early in the morning, and there were soon between 2,000 and 3,000 penned. There was also a large quantity of horses, between 200 and 300. A large business was done, the cattle changing owners quickly, at prices of which the following may be quoted as a fair average. Mutton without the wool, 6d. to 7d. per lb. Store tegs in the wool 50s. to 3 gu. per head. Ewes and Lambs and couples from 58s. to 70s. Store cattle realized high prices. Barren cows £14 to £15 per head. Milch cows £10 to £17 per head. Two-year-old steers from £12 to £18 per head. Beef 7d. per lb. Cart horses £30 to £35 each. Second class horses £12 to £20. Nags £20 to £30. Quarter old pigs 24s. to 28s. per head. Sows and litters £8 to £9. Porkers 10s. per score.

SHREWSBURY FORTNIGHTLY FAIR.—There was a large supply of stock; consequently there was a flatter trade, notwithstanding that the attendance of buyers was unusually great. Prime beef realized 7d. per lb.; secondary qualities, 6½d.; best wether sheep (shorn) fetched 7½d., and other descriptions 7d., fat calves 7d. per lb.; lambs from 26s. to 35s. each; bacon pigs 5½d., and porks 5½d. per lb. Good cows and calves sold well, and store bullocks rather dearer; but barren cows were lower, as also were store pigs.

ST. COLUMB MONTHLY MARKET.—There was a good supply of fat bullocks, which sold readily at prices from £8 to £3 8s. per cwt. There were no fat sheep in the market, but ewes and lambs fetched from £2 10s. to £2 15s. a couple. Cows and Calves were not numerous, but sold well.

TALGARTH FAIR.—In the cattle trade there was an active demand at good prices; fat ones sold at from 7d. to 8d. per lb. There were not so many pens of sheep as at the previous fair; but what were offered met with a ready sale; fat ones from 9d. to 10d. per lb. Pigs were much higher in price, and met with a ready sale. The horse fair was rather below the average; good carters met with a brisk sale at good prices. A great many entire horses were exhibited, some of them being very fine animals.

TEWKESBURY FAIR was largely attended by butchers and dealers. There was a good quantity of stock. Beef made from 7d. to 7½d., mutton 7d. to 9d. per lb.

WINSLOW FAIR.—There was a good supply of cow stock. Good useful heifers from £16 to £22; down-calving cows £17 to £23, and other stock at remunerative prices, with a steady sale.

WORCESTER FAIR.—There was a good supply of all kinds of stock, and a large attendance of buyers. Fat beef was in great request, and realized from 7d. to 7½d.; stores not so much sought after. Fat and store sheep met a ready sale, wethers fetching from 7d. to 7½d., and ewes 6½d. per lb. out of the wool. Ewes and lambs sold readily, at from 55s. to 60s. Calves realized 7½d. per lb. Pigs were principally of the store kind, and sales were not readily effected. There was a good horse fair, and some superior animals sold readily, but the trade in general was dull.

IRISH FAIRS.—**CASHEL**: There was a good supply of stock; trade active. Prices ruled as follows: Two-year-olds £7 to £9 10s., new milch cows £10 to £14, springers £9 to £12, strippers £8 10s. to £13, yearlings £4 to £6, sheep 38s. to 50s., store pigs 40s. to 50s., boahams 24s. to 30s. per couple.—**KILLS (Co. MEATH)**: In the beef department all the lots offered were quickly disposed of, some fat beasts (stall fed) fetching £20 to £21 per head, or a shade under 60s. per cwt. Inferior beef rated from 4½d. per lb. upwards, and all was sold out. There was a pretty ample show of store cattle and strippers. J. Batterby, Esq., purchased a large lot of stores at £12 10s. each. Mr. Finn, of Oldenastie, disposed of some thirty head of three-year-olds at a like figure, and numerous other lots of two and three-year-old stores were disposed of from £8 10s. to £18 per head, according to merit. Yearling heifers and bullocks sold from £4 to £7 per head. Hoggets rated from 45s. to 52s. each. Bacon rated at fully 47s. 6d. per cwt., pork 45s. to 48s. per ditto.

Stores sold from 40s. to 60s. each, suckers and weanlings from 15s. to 20s. each, runners averaged 25s. to 30s. per head. CASTLEPOLLARD was extensively supplied in each department, and buyers were numerous. The exhibition of beef was large. Strippers and store bullocks sold very well. R. W. Reynell, Esq., bought upwards of fifty strippers, at prices from £12 to £16 each. He gave as much as £32 10s. for a cow and calf. Two years old heifers and bullocks were much inquired after. The principal show in the sheep market comprised wethers and hogget lambs, which were bought up at extreme rates. The supply of bacon pigs was very large. The buying was very brisk, at an average of 45s. per cwt. The supply of stores was equally good, the rates from £2 5s. to £3 5s. Suckers were also in good demand.—RATOAH: There was very little beef. Dry cows and store heifers and bullocks were in fair show. The demand was tolerable, considering the present prospect of grass. Dry cows, however, sold far better than store heifers. Two years old bullocks exchanged owners at prices decidedly in favour of sellers; they might be noted from £8 10s. to £11, and yearlings from £4 10s. to £7 per head. In the springer department the supply was rather below that of last year, and the demand good; enhanced prices were readily obtained. They brought from £12 to £18 and £20 each, and all were briskly sold out, more particularly those at the dropping. The swine department was one of considerable animation, and jobbers bought up bacon at an average of 45s. per cwt. Store pigs and suckers fetched remunerative rates also, and a large number of them changed hands. TULLOW: There was a large supply of stock and a good attendance of buyers from Dublin, Meath, and the adjoining counties, at this fair. The business, which was very brisk, commenced at an early hour. Beef, first quality 65s. per cwt., second-rate 56s., inferior qualities 48s. to 53s.; mutton, 8½d. per lb. for first-class, and second quality 1d. per lb. cheaper, with small supply of fat sheep. Store cattle plentiful, and in good demand, at high prices; strippers £11 to £14, three-year-old heifers £10 to £18, two-year-olds £8 to £10, yearlings £4 to £7; springers and milch cows brought very high prices, ranging from £11 to £18 each, according to quality. There was a large pig fair the previous day, which was well attended with Waterford and other buyers. Bacon pigs from 56s. to 60s. per cwt., pork from 48s. to 52s.; stores from 30s. to 40s., and bonhams from 18s. to 25s. each.

SALE OF DUTCH CATTLE AT HARWICH.—Mr. G. M. Sexton commenced his sales of Dutch cattle at Harwich on April 16. The Dutch oxen and heifers offered were mostly from Schiedam, having been shipped on board the Great Eastern Railway Company's boats at Rotterdam and landed at Harwich on Thursday night and Friday morning. They had travelled some miles on the Dutch Rhemish Railway on Thursday, in addition to the sea passage, so that they were rather wearied, nevertheless they appeared to be in fair condition. Mr. Newell purchased beasts at £25, £21 5s., and £18, and some fine growing heifers at £12, £14 10s., £18 10s., &c. Mr. Robinson, of Ipswich, bought steers at £21, £23, £18, and £18 5s.; Mr. Cox at £21 5s., £23 10s., and £19; Mr. Jones, of Ipswich, at £22 15s.; Mr. Hillen at £22 5s., £22 15s., &c. The fat heifers offered ranged from £14 10s. to £19 5s., some of them being well shaped and in good condition. Young heifers were sold to Messrs. Mudd, Payne, Cooper, Newell, Tye, &c., at £4 17s. 6d. to £8 2s. each. A score of fat Dutch hogs realised 65s. each.

EDINBURGH LIVE STOCK SALES.—Trade was brisk, and late prices fully supported, best beef realising from 8s. to 8s. 6d. per stone, and sheep from 8d. to 9d. per lb. Pigs a shade lower, and selling from 8s. 9d. to 6s. 6d. per stone. The best class of bullocks sold from £23 to £25 10s. per head; a great number of smaller bullocks and heifers, of good quality, running from £17 up to £20 per head. Cows sold from £22 down to £7 per head. Blackfaced widders 32s. to 46s., half-bred 48s. to 54s. per head. Pigs 32s. to £8 per per head. Fat calves £3 to £5. GRANTON: Small short-horns £17 to £18, large £20 17s. 6d. to £25 10s., per head, small Highland bullocks £10 2s. 6d. to £18 15s., large £23 to £24. Fat cows £11 17s. 6d. to £25 10s. Fat lambs 38s. 6d. to 36s. Beef 7s. 3d. to 8s. 3d. per stone. DALKEITH: Cheviot widders 50s. 6d. to 53s. 6d., half-bred hogs 44s. to £4. 6d., ditto clipped 37s. to 42s., half-bred gimmers 36s. 3d.,

grey-faced widders 36s. 6d., black-faced 28s. to 30s., tups 55s. to 64s. 6d. The best cattle brought from £19 to £24 2s. 6d., others £15 to £18. A lot of small stots and queys brought from £10 17s. 6d. to £14 5s. Fat cows £12 15s. to £21 10s. Milk cows £11 to £20 12s. 6d. Calves 11s. 6d. to 60s. Pigs 30s. to 70s.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, MONDAY, April 25.—During the past week the arrivals coastwise and by rail have been far in excess of the demand, which has fallen very much. In consequence of very hot, bright sunshine, the trade is in a very languid state. The following are this day's quotations—

Yorkshire Flukes	per ton	50s. to 60s.
" Regents		40s. to 60s.
" Seedlings		40s. to 50s.
" Rocks		40s. to 50s.
Dunbar Regents		50s. to 60s.
Kent and Essex Regents		50s. to 60s.
North Berwick Regents		45s. to 50s.
Perth, Forfar, and Fifeshire Regents		35s. to 45s.
" " Rocks ..		30s. to 40s.
" " Reds ..		30s. to 40s.

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, April 25.—Large supplies of Potatoes continue on sale at these markets. For all qualities the trade is dull, and the quotations have a downward tendency.

Yorkshire Regents	50s. to 70s. per ton.
Ditto Flukes	60s. to 80s. "
Ditto Rocks	40s. to 50s. "
Scotch Regents	50s. to 70s. "
Ditto Rocks	40s. to 50s. "
Kent and Essex Regents ..	45s. to 60s. "

MANCHESTER POTATO MARKET, (Saturday last)
—Potatoes 4s. 6d. to 8s. per 252 lbs.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, April 25.—Our market is in a very dull state, with drooping prices, so that it is difficult to make quotations as to value, but say about as under:

Dorset, fine	116s. to 120s. per cwt.
" middling	100s. to 104s.
Fresh	11s. to 14s. per dos. lb.

CARMARTHEN BUTTER EXCHANGE, (Saturday last).—Our Butter market for the season may now be considered as fairly opened. Old Butters are exhausted in this district, and the supply of new Butter to-day was very limited, so that farmers freely obtained 13d. to 14d. per lb. If we get seasonable rains we shall soon have Butters down, but at present we have every indication of continued drought, cold nights, with withering easterly winds, and a scorching sun in the day—all adverse to the growth of pasturage.

CORK BUTTER EXCHANGE, (Saturday last).—The supplies this week in our market averaged about 600 skins daily. Sales were slow, prices being much too high for speculation. Prices fell considerably on the week. Since Monday seconds fell from 116s. to 112s., thirds from 110s. to 100s., and fourths from 86s. to 78s. The supply of mild-cured Butter is yet very trifling, and we quote 105s. for thirds to-day.

CHESTER CHEESE FAIR.—Sixty tons of cheese were pitched. The prices ranged from 45s. to 50s., 55s. to 60s., 65s. to 70s., and some dairies realised 75s.; all sold.

GLASGOW, (Wednesday last).—A good supply of Cheese, with few buyers, and the market dull, but no change in price. Only six tons passed the weigh-house scales. Dunlop 54s. to 63s.; Cheddar made 62s. to 65s., skim milk 24s. per cwt.

SALISBURY MONTHLY CHEESE MARKET (Thursday last).—There were about 100 tons of cheese pitched, which met with a steady sale, the greater part being disposed of at the following prices: New skins 20s. to 24s., old skins 30s., Doubles 68s. to 63s., Somersetts 66s. to 72s. per cwt.

WOOL MARKETS.

ENGLISH WOOL MARKET.

CITY, MONDAY, April 25.—Although money for commercial purposes is high in price, and although about 90,000 bales of colonial wool will be shortly offered for sale in the metropolis, our market continues to rule very firm. No actual advance has taken place in prices; yet very few sellers are coming forward at current rates.

	s.	d.	s.	d.
Fleeces.—Southdown hoggets Per lb.	1	11½	to	2 0½
Half-bred ditto	2	3½		2 4½
Kent fleeces.....	2	0½		2 1
Southern ewes and wethers	1	9		1 10
Leicester ditto	1	11		2 0
Sorts.—Clothing.....	1	6		1 10
Combing	1	6		2 0½
Superior Lincoln Hoggets	2	6		0 0

BRADFORD WOOL MARKET, (Thursday last).—We observe in our market to-day a good consumptive demand for most classes of wool, but an entire absence of anything like speculation. The total amount that has changed hands is perhaps somewhat less than has been usual of late, yet full prices are still obtained notwithstanding arrivals of new clip wools and a tighter money market. We understand 2s. 6d. per lb. is about the top figure obtained at York to-day for new lustre hoggs. Some of our large buyers calculate that such a price as this will bring the new clip forward in large quantities, and consequently cause a downward tendency, but our market is in such an abnormal position that the best opinions may be very wide of the mark. But this much appears to be pretty certain, that the farmers may, and probably will obtain higher prices this year than they have ever obtained before, but the opportunity may be short for doing so.

EXETER, (Friday last).—Yolk wool 1s. 5d., washed 1s. 10d. per lb.

LEEDS (ENGLISH AND FOREIGN) WOOL MARKETS, (Friday last).—There is again a little more activity in the English wool market, and prices for the new clip are very high, having reached 2s. 5d. per lb. for superior hogg wool. For colonial wool there is a healthy demand, and prices are well maintained, especially for good Port Philip fleeces.

YORK WOOL MARKET, April 21.—At to-day's market, in addition to 30 sheets of wool of the clip of 1863, we had 46 sheets of prime hogg fleeces from fat Leicester hogg sheep, which were all sold at prices ranging about 2s. 5½d. per lb. The demand for this class of wool (which can only be obtained from the counties of York, Leicester, Nottingham, and Lincoln) has greatly increased of late years, being required by the manufacturers of those beautiful fabrics now produced for the fair sex, and which in fineness of texture are equal to silk. Only the finest quality of bright lustre wools can be used by them, and hence the great demand. At to-day's market Mr. Blanchard, of Market Weighton, showed 23 sheets of excellent wool, including the fleeces of 100 fat hoggs from Mr. Thorpe, of Aldro House, who has long been noted for the excellent condition of his wool, consequent on tub-washing, and this sample realised 2s. 6d. per lb., with "a return for luck." —*Yorkshire Gazette.*

LIVERPOOL WOOL MARKET.—April 23.

SCOTCH.—There has been a fair demand for laid Highland during the week, at the advance previously quoted. White Highland none in the market. Cheviot still enquired for; stock all but exhausted.

	s.	d.	s.	d.
Laid Highland Wool per 24 lbs.	17	6	to	19 6
White Highland do.	22	0		24 0
Laid Cheviot do. ..unwashed.....	28	0		31 0
Do. do. ....washed.....	33	0		36 0
White Cheviot do. ....washed.....	44	0		48 0

FOREIGN.—The continued rise in domestic wools has the effect of stimulating transactions in most classes of foreign, and prices are generally in favour of sellers. The public sales for East India wool will commence here on the 3rd May, when about 8,000 to 9,000 bales will be brought forward.

GLASGOW WOOL MARKET, (Saturday last).—The

rise in the rate of interest has checked operations to some extent in this market. There being only very light stocks on hand, however, has tended to keep prices steady. No alteration can be quoted in rates. Holders are perfectly firm, and the difference in value is rather in favour of sellers. Good bred Wools are wanted for combing purposes, and prices are very high.—*W. F. H. M'Leod.*

WOOL.—FRANCE.—The demand for wool has been generally pretty active, and this trade seems about to take a new stride. At Havre, Buenos Ayres wool, in a dirty state, has made 1s. 3d. to 2s. 1d. per kilogramme (the fiftieth part of an English cwt.); La Plata 1s. 4d. to 1s. 10d., Monte Videon, in a dirty state, 1s. 10d. to 1s. 11½d.; sheep's hides, La Plata 1s. to 1s. 2½d., Buenos Ayres 1s. 3½d. to 1s. 10½d. At Marseilles, white washed Mossoul has made 1s. 9d. to 2s. 6d., and Jumel 1s. 9d. to 2s. 9d. per kilogramme.

BRESLAU WOOL REPORT, April 21.—We had again a very good attendance of home and foreign purchasers, who showed themselves very anxious to secure their wants. Yet owing to the great clearances effected in the last two months, and the consequent exhaustion of our stocks, the demands could not nearly be satisfied, and transactions in all were not beyond 3,000 cwt. Prices displayed a rising tendency, especially in finer qualities, which have become very scarce. The greatest amount of business has been done in fine Polish, Posen, and Silesian fleeces, at from 78 to 98 thalers per cwt., which have been acquired by an extensive Rhemish manufacturer. But the lower and middle fine descriptions of Polish, Russian and Hungarian wool at from 45 to 56 thalers, equally met a very ready sale, being mostly acquired by home and Saxon combers and clothiers. In general the state of our trade is a very healthy one, and with the continuance of a very remunerative employment of our manufacturers, who have still large orders on hand, we expect for the next future a very lively trade, with improving prices. Accordingly speculators have made again very large contracts on the sheep's back, at fully last year's quotations.—*GUNSBURG BROTHERS.*

AUSTRALIAN WOOL MARKET, MELBOURNE, Feb. 4.—During the month active operations have well sustained, and, out of a total of 19,890 bales catalogued at the public sales, about 10,000 bales have changed hands at prices which, generally speaking, have been satisfactory to growers. At the date of our last summary the English mail had arrived with advices of the progression of the November sales in London at rates scarcely so favourable as had been anticipated; but the result of this news on the colonial market had not been tested by a sale at auction. When this took place, it became evident that growers had decided to meet the market by making a slight concession in price; and, as buyers were prepared to purchase at these limits, considerable sales were effected, and in the course of a few days we had the pleasure of placing over 5,000 bales. This improved tone of the market has been well maintained up to the present date, and the quantity offering for sale is gradually becoming more limited under the spirited operations of buyers; but there is still a considerable quantity in store which cannot be placed until owners' limits are slightly reduced. Compared with the previous month, prices for washed fleece have not shown any material alteration; but on inferior to average greasy, of which a large quantity has been in the market, we must quote a decline of fully 0½d. per pound. The result of last season's operations has had the effect of inducing caution on the part of buyers; and certainly throughout this season they have kept steadily to their limits, and would not purchase even when large quantities might have been bought at within a shade of their valuations. Growers, however, have no reason to complain at the rates obtained for their produce, as quotations have approximated fully in proportion to those of the London markets, leaving them the gainers in being secured from all the risks attendant on shipment to a distant market. Prices current: Greasy—inferior to ordinary 7d. to 9d., ordinary to average 9d. to 10½d., good to superior 10d. to 1s. 0½d. Fleece—inferior to ordinary 1s. 3d. to 1s. 5d., ordinary to average 1s. 6d. to 1s. 8d., good to superior 1s. 9d. to 1s. 11d. Scoured—ordinary 1s. 4d. to 1s. 7d., good 1s. 8d. to 10d., superior 2s. to 2s. 3d.—*Goldborough's Monthly Circular.*

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

April has passed away without its usual complement of rain, but with a considerable variety of temperature. A summer heat was experienced during the third week; but with a return to easterly winds, considerable cold was felt, and some frost occurred. The dry weather was, however, wanted for the completion of spring sowing in many places, especially in the late districts; and though it has begun to be feared, both here and on the continent, there is nothing as yet to cause alarm, the drought being only superficial. It is, however, very desirable that we should now have some nice warm showers, the spring being backward; but we may yet hope that all will be well. The late severe fluctuations of temperature are reported to have done some damage to the young wheat in exposed places, and on the light lands, there being much mis-plant; but should a genial season follow, the thinner plants may tiller out sufficiently to yield a good crop. On the stronger soils the changes have had but little effect, and there the plants for the most part look strong and well. Vegetation has been forced by the brilliant sunshine where there has been sufficient moisture to sustain its growth, and the meadows and early-sown spring corn have been making fair progress. Business, as respects the wheat trade, has still been very languid, the question of peace or war for Europe not being settled; but the fact of the assembling of a Congress gives hopes that the effusion of blood will be stayed by a more humane and reasonable policy than that which has characterized the progress of the German allies towards Denmark. But it is easier to kindle strife than to quell it, and the success of Prussia and Austria may produce inadmissible pretensions. Should these be set up, war may take a wider range, and involve our own country, which would immediately give a new aspect to the corn trade. As it is, prices of wheat have receded during the month about 1s. per qr.; but the slight fluctuations of the general averages, say from 39s. 11d. to 40s. 1d. per qr., with all the reports of depression, seem to indicate that about the lowest point is reached, and as foreign imports are materially falling off, and the remainder of the crop is getting into the hands of farmers more prepared to hold (which many seem resolved to do) under present low prices, the chances seem much more in favour for a rise than fall. This resistance to lower rates is seen on the continent as well as here, Danzig remaining firm under the Danish blockade, which has had a hardening effect in Holland and Belgium, though no influence on our own prices. Portugal has suffered by storms. Odessa has found her customers in Italy instead of England, from the better prices paid at Venice, Genoa, and Leghorn; while Egypt, from the devastations committed by the Nile, has prohibited exports, and invited importations, her quo-

tations for her own inferior weak wheat being 40s. 6d. per qr., while our strong handsome red is offering at 39s. The world's wide range, therefore, seems to back English rates as they now stand, and a little further depression would make us an exporting country. American prices are so demoralized by the high value of gold and exchange, and labour is so abstracted from the fields, that the Federal power of export must be seriously diminished on the opening of the lakes, which will not occur before the middle of May, and should the hopelessness of the struggle lead to the acknowledgment of the Southern States, their wants would make a serious diversion of the surplus yet in store. The following rates have been current lately at the several places named:—The best white wheat in Paris brought 43s. to 44s. per qr. Fine Pomeranian at Antwerp was worth 45s. 6d., winter American 43s. 6d.; high-mixed Polish at Amsterdam 51s.; Saale and Marks (red) at Hambro' 40s. The best new high-mixed at Danzig was held at 42s.; native wheat at Cologne, 43s. 6d.; Bavarian at Straubing, 43s.; the best soft Polish at Odessa, 35s. 6d.; Ibraila qualities about 33s.; Saida wheat at Alexandria, 40s. 6d.; native sorts at Venice 45s. to 50s.; soft wheat at Algiers, 45s. per qr. The incessant fluctuations made New York quotations unreliable, but the following values per qr. of 480lbs. may be taken as near the mark, viz., Chicago spring 32s. 6d. winter red 34s. per qr., and fine white 37s.

The first Monday in Mark Lane opened on the back of a moderate supply of English wheat and good foreign arrivals. The morning's show from Kent and Essex was small, but the condition was improved. Millers, however, having plenty of choice in foreign qualities, were very careless, buyers readily obtaining what they needed on the previous terms. The business also in foreign was of a retail character, and chiefly consisted of purchases of useful old for mixing. With moderate arrivals at the ports of call, prices were much the same. The country reports this week evinced weakness, and inferior qualities, in many instances, were rather cheaper, but good well-conditioned samples went off freely at Ipswich, Hull, Rugby, St. Ives, and some other places, but Bristol was 1s. down, the same reduction also being noted elsewhere. Liverpool was unaltered both on Tuesday and Friday. Glasgow prices were scarcely supported, but Edinburgh noted an advance of 6d. to 1s. per qr. Rough and unsuitable weather for seed time had ruled in Ireland, but Dublin was unaltered as respects prices.

The second Monday had a considerably diminished supply both of home grown and foreign wheat. The show from Kent and Essex was moderate during the morning, but as it included some of the overleft samples of the previous week,

appeared more than of late. There was a very small attendance, it being the day of Garibaldi's arrival in London, and to have made any way in sales would have brought some decline, but holders not being disposed to force business, rates remained nominally as before. New foreign would have been decidedly cheaper to sell from ship, but granary parcels went off slowly at the previous currency. With few cargoes afloat offering, there was no change of value. The country reports were quite as dull as those of London with regard to the wheat trade, though good parcels from scarcity maintained former rates in several towns; but as the week wore on, the heaviness so increased that most of Saturday's markets were 1s. per qr. down. Liverpool was 1d. per cental cheaper for red American. Glasgow made sales at rather less money, and Edinburgh lost the previous week's advance of 1s. per qr. In Ireland business was slack, with little difference in quotations.

On the third Monday, though the English supply was but moderate, it exceeded the foreign arrivals. The morning's contributions from the near countries were again on a moderate scale, but some of the previous Monday's again appeared. The hanging about of these samples was against the trade, which gave way fully 1s. per qr., and without a clearance being made at the reductions. The announcement of a Danish blockade (at the ports of Danzig and Königsberg induced some holders of these qualities to withdraw their samples, while others placed higher limits on them. This, however, did not stimulate purchases, and the entire trade was dull, including that of floating cargoes. The wheat trade in the country was influenced downwards this week by the dulness of the London advices: many markets were 1s. lower; among these were Birmingham, Boston, Hull, Ipswich, Gloucester, Lynn, Market Harbro', Melton Mowbray, Manchester, Salisbury, St. Ives, Stockton, Wolverhampton, and Uppingham. Liverpool was 1d. to 2d. per cental cheaper on Tuesday, and dull on the following market. Glasgow and Edinburgh, however, did not give way though heavy, and Dublin was unchanged.

The fourth Monday began with a better English supply, while the foreign was doubled, being mostly from Dantzic and New York, the former quality greatly in excess. There was very little offering from Essex this morning, but a few more samples from Kent. The drying easterly winds of the previous week having further improved the condition of samples, they were more rapidly taken by millers at former prices, but as the day advanced there was less activity in the trade. The enquiry for foreign was very limited, and chiefly for useful old qualities. To have sold new would have required the acceptance of lower prices. The floating trade was dull, but rates about the same.

The imports into London for four weeks were in English qualities 21,798 qrs., foreign 46,391 qrs., against 13,685 qrs. English, 57,045 qrs. foreign for the same period in 1863. The foreign imports into the Kingdom for four weeks ending 16th April were 350,247 qrs. wheat, 437,359 cwt. flour. The London averages commenced at 43s. 5d., and closed at 42s. 1d. per qr.

The flour trade has been very dull through the entire month, the hot weather for some time prevailing being very much against the condition of samples. Yet the decline can hardly be estimated at over 1s. per sack on country made, and about 6d. to 1s. per barrel on American sorts, while the top price of town made has remained 40s. per sack. Good barrels being about 22s. per barrel, extra to 25s., Norfolks to 27s., country household 30s. to 31s. per sack. The importations for four weeks into London were in country sorts 60,804 sacks, foreign 1,045 sacks 29,175 barrels, against 55,429 sacks country, 857 sacks 41,113 barrels foreign in 1863.

The barley trade all through the month has been extremely heavy, maltsters drawing their principal supplies entirely from the country, and the warm weather at the close reducing trade to the minimum. Prices, therefore, for the best are not to be depended on, though 35s. to 36s. may still be quoted for English, and about 30s. per qr. for Saale qualities; while grinding sorts remain as low as 22s. per qr. at 50lbs. per bushel, and medium descriptions have ranged between. Supplies, both English and foreign, have been much diminished; and were it not for the low price of oats, there might have been higher values. The imports into London for four weeks were, in British sorts, 8,218 qrs., foreign 14,375 qrs., against 5,282 qrs. British and 42,554 qrs. foreign for the same period in 1863.

The malt season may be considered at an end, the large brewers declining further purchases, and there being a good stock left on hand.

The oat trade, which opened with more briskness and some advance—say 6d. to 1s. per qr.—on the first Monday, nearly lost the improvement on the second, and finally was tending further downwards, notwithstanding the Danish blockade and some apprehensions beginning to be entertained about drought. 40lbs. Swedes are still procurable at 19s. per qr., and very heavy weights at 22s.; while fine old Russian, now getting scarce, can be had at 19s. to 20s. Large stocks are said to be still held in Sweden; but our own supplies, as well as those of Scotland and Ireland, have been running short, and we can hardly expect rates to go lower, or even remain long at such a point of depression. The four weeks' imports into London were 10,268 qrs. English, 8,458 qrs. Scotch, 11,824 qrs. Irish, 98,516 qrs. foreign, against 10,304 qrs. English, 142 qrs. Scotch, 110 qrs. Irish, 127,449 qrs. foreign in 1863.

The bean trade all through the month has had more firmness, the English supplies being lessened and the quality improved; while foreign imports have been only moderate, and less may be expected from Egypt, in consequence of the overflow of the Nile and the relatively high prices at Alexandria. Mazagan of good quality are worth about 30s., Egyptian 31s. per qr. The imports into London for four weeks were in English 3,804 qrs., foreign 2,950 qrs., against 1,840 qrs. English, 2,036 qrs. foreign in 1863.

The business in peas has been limited, and so have the supplies. The demand for boilers has almost ceased, and that for hog-feed has been

greatly interfered with by the low rates obtaining for other grain; fair white quality were to be had at 32s. to 35s., dry hog peas at 30s., maples at 35s. Blues have this year been grown so extensively as to become of only similar value, excepting rare sorts for seed. The imports into London for the four weeks were 692 qrs. English and 1,000 qrs. foreign, against 305 qrs. English and 6,396 qrs. foreign in 1863.

The supplies of linseed having fallen short, and a good export demand kept up, prices have risen about 3s. per qr.; but sales were lessened by the advance, and cakes have been dull all through.

The seed trade has run its course very indifferently for importers and dealers. The first arrivals of foreign red cloverseed paid very well; but the English crop turning out better than expected, and farmers having plenty of their own, and the season being very rough and unfavourable for some time, made trade very disappointing. Canary-seed of good quality has again rather improved, but tares have fallen to quite a feeding price, and for such purpose will very likely be soon used up.

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.		
March 12, 1864....	40	1	31	5	19	8	29	2	32	7	32	0
March 19, 1864....	39	9	31	4	19	3	32	4	32	10	32	10
March 26, 1864....	39	11	30	10	19	0	28	0	32	8	33	3
April 2, 1864....	40	2	31	0	19	2	28	5	33	6	32	11
April 9, 1864....	40	1	30	9	18	11	29	0	32	8	32	5
April 16, 1864....	40	1	30	10	19	3	27	8	33	0	31	11
Aggregate Average	40	0	31	0	19	2	29	1	32	9	32	9
Same time last year	45	5	36	2	21	5	32	6	35	11	35	8

COMPARATIVE AVERAGES—1864-63.

From last Friday's Gas.	s. d.	From Gazette of 1863.	s. d.
Wheat.....	89148 qrs. 40	1 Wheat.....	73942 qrs. 45
Barley.....	34862 .. 30	10 Barley.....	23240 .. 35
Oats.....	10675 .. 19	3 Oats.....	9393 .. 21
Rye.....	95 .. 37	8 Rye.....	55 .. 30
Beans.....	4578 .. 33	0 Beans.....	3374 .. 36
Peas.....	543 .. 31	11 Peas.....	401 .. 38

PRICES OF SEEDS.

BRITISH SEEDS.	
MUSTARD, per bush., white.....	3s. 6d. to 10s.
CORIANDELS, per cwt.....	14s. 16s.
CANARY, per qr.....	50s. 56s.
TARES, winter, new, per bushel.....	0s. 0s.
TRIFOIL.....	30s. 35s.
LINSEED, per qr., sowing —a. to 72s., crushing	58s. 61s.
LINSEED CAKES, per ton.....	£9 10s. to £10 10s.
RAPESEED, per qr.....	62s. to 65s.
RAPE CAKE, per ton.....	£5 10s. to £6 0s.
FOREIGN SEEDS.	
CORIANDELS, per cwt.....	16s. 18s.
CARAWAY	—s. —s.
TRIFOIL.....	30s. 34s.
CLOVERSEED, red 44s. to 50s., white.....	50s. to 60s.
LINSEED, per qr., Baltic 58s. to 60s., Bombay	68s. —s.
HEMPSEED, small —s. per qr., Dutch.....	—s. 42s.
LINSEED CAKE, per ton.....	£9 10s. to £11 0s.
RAPESEED, Dutch.....	—s. 10s. —s.
RAPE CAKE, per ton.....	£5 0s. to £6 0s.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter.
WHEAT, Essex and Kent, white.....	new 38 to 45 old 38 to 42
" " red.....	" 38 40 .. 38 40
Norfolk, Lincoln, & Yorksh., red ..	38 40 .. 38 40
BARLEY, new.....	22 to 28.....Chevalier... 28 36
Grinding.....	22 28.....Distilling... 25 28
MALT, Essex, Norfolk, and Suffolk.....	new 60 65
Kingston, Ware, and town-made.....	60 65
Brown.....	50 54
EYE, new.....	30 31
OATS, English, feed 17 to 22 ..	Potato..... 21 23
Scotch, feed 19 ..	Potato..... 20 23
Irish, feed, white 15 ..	.....fine 19 21
Ditto, black, new 15 ..	Potato, new .. 19 22
BEANS, Masagan .. 28 ..	Ticks..... 28 29
Harrow.....	32 33.....Pigeon..... 35 40
PEAS, white, boilers 36 ..	Maple 31 to 35 Grey 29 30
FLOUR, per sack of 280 lbs., Town, Households.....	32 40
Country.....	26 to 28.....Households..... 26 31
Norfolk and Suffolk, ex-ship.....	26 27

FOREIGN GRAIN.

	Shillings per Quarter.
WHEAT, Dantico, mixed.....	48 to 50..old, extra 52 to 55
Konigsberg.....	47 49..... 50 51
Rostock.....	44 46.....fine 46 47
Silesian, red.....	42 44.....white 42 48
Pomer., Meckberg., and Uckermark, red.....	43 48
Danish and Holstein, red.....	41 44
Russian, hard 37 to 41... St. Petersburg and Riga	38 38
French, none.....	Rhine and Belgium.... 42 45
American, red winter 42 44, spring 41 42 white	45 48
BARLEY, grinding... 21 to 23...distilling and malting	24 26
OATS, Dutch, brew, and Polands... 17 to 22...feed... 18 19	
Danish and Swedish, feed... 18 to 20...Stralsund... 18 20	
Russian, Riga 19 to 20...Arch., 19 to 20...P'sburg 19 21	
BEANS, Friesland and Holstein.....	30 34
Konigsberg.....	30 to 33 .. Egyptian... 30 31
PEAS, feeding and maple.....	30 34 .. fine boilers... 33 35
INDIAN CORN, white.....	29 32 .. yellow..... 27 31
TARES, Spring 30s. to 32s. per qr. large 46...Lentils 27 30	
FLOUR, per sack... French 21 33...Spanish, per sack 28 33	
American, per bri... 18 to 21...extra and dble... 28 28	

FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT.

PRICE.	March 12	March 19	March 26	April 2	April 9	April 16
40s. 2d.
40s. 1d.
39s. 11d.
39s. 9d.

HOP MARKET.

BOROUGH, MONDAY, April 25.—Our market continues steady with a moderate demand for home growths; other descriptions are not in request.

Mid and East Kents..... 120s., 140s., 180s.
 Weald of Kents..... 115s., 130s., 145s.
 Sussex..... 105s., 120s., 130s.
 Bavarians..... 105s., 135s., 160s.
 Belgians..... 80s., 84s., 95s.
 Americans..... 105s., 120s., 132s.

MANURES.

PRICE CURRENT OF GUANO, &c.
 Peruvian Guano, direct from the importers' stores, or ex ship (30 tons) £12 5s. to £12 10s. per ton.
 Bones, £6 crushed, £6 10s. per ton.
 Animal Charcoal, (70 per cent. Phosphate) £5 per ton.
 Coprolite, Cambridge, (in London) whole £2 5s. to £2 8s., ground £1 to £3 5s.; Suffolk, whole £1 11s. to £2, ground £1 10s. to £1 11s. per ton.
 Nitrate of Soda, 17s. per cwt.
 Sulphate of Ammonia, £14 10s. to £15 10s. per ton.
 Gypsum, 30s. per ton. Superphosphate of Lime, £5 to £6 s. p. ton.
 Sulphuric Acid, concentrated 1-245 1d. per lb., brown 1-712 1d.
 Blood Manure, £6 8s. per ton. Dissolved Bones, £6 10s. per ton.
 Linseed Cake, best American, £10 10s. per ton, ditto £10 to £10 5s. per ton; English, £10. Rape Cake, £5 10s. per ton.
 Cottonseed Cake, £1 10s. to £5 per ton.

E. PURSER, London Manure Company, 116, Fenchurch Street, E.C.

LIVERPOOL SEED AND GUANO, &c., MARKET.

Guano, Peruvian £19 7 6 to £20 0 0	Linseed Cake, per ton.....
Do. Upper de 3 10 0 0 0	American, thin, Ag. £2 17 6 to 2 18 0
Patagonian .. 0 0 0 0 0	Do. in briks .. 0 0 0 0 0
Keora Moria .. 0 0 0 0 0	English
Bone Ash	Cotton Cake, decent 0 0 0 0 0
Sulphate, Bengal, ..	Brimstone, 3d & 2d 0 0 0 0 0
3 per cent.	Nitr. of Soda, p. c. 0 18 4 0 18 4
Clovesed, new ..	Linseed, per qr. 3 4 6 3 5 2
red, per cwt. ... 1 16 3 3 8 9	Tallow, 1st F.Y.C. 2 3 0 2 4 0

SAMUEL DOWNES and Co., General Brokers, Exchange Court, Liverpool.

Agricultural Chemical Works, Stowmarket, Suff.	
Prentice's Cereal Manure for Corn Crops.....	per ton £ 15 0
Mangold Manure.....	10 2 0 0
Prentice's Turp Manure.....	6 10 0
Prentice's Superphosphate of Lime.....	6 0 0



Queen Martha.
At the age of four years she produced a foal of the name of

PLATE V.

A HEREFORD OX;

THE BEST OX IN ANY OF THE CLASSES AT THE SMITHFIELD CLUB SHOW, 1863.

This ox, exhibited by Mr. William Heath, of Ludham Hall, Norwich, was bred by Mr. Thomas Lockley Meire, of Cound Arbour, Shrewsbury, and got by Franky (1243), out of Rose by Cound (1193). Franky, also bred by Mr. Meire, is by Walford (871), out of Old Perfect by Speculation (387). Cound, the sire of the dam, bred, as his name implies, at Cound, was by Layman (767), out of Young Perfect by Lawyer (627), her dam Old Perfect by Speculation (387). Franky is now in Mr. Duckham's herd, and Walford, a Royal prize bull, the property of Lord Berwick, was the sire of many first-class animals, amongst others of Attingham. It will be seen from the pedigree that this ox is bred in-and-in to Speculation, a bull of Mr. Meire's, and the sire of many other winners at the Royal and Smithfield Club shows.

Mr. Meire and his family have long been breeders of Hereford cattle, but he has discontinued exhibiting for nearly twenty years, preferring that others should have the trouble and risk of preparing the beasts for show; while he is "inclined to view so much that has appeared in print as puff," that it may be better not to say anything more as

to the merits of his stock. This ox was consequently sold to Mr. Heath, the well-known Norfolk feeder, who kept him back for the Smithfield Club Show of December last, when at four years old the beast took the first prize of his class, and the silver cup of £40 as "the best steer or ox in any of the classes," with the silver medal to Mr. Meire as the breeder. The Hereford was sold here to Mr. Davis, of the Islington Cattle Market, who declared his weight at 126 stone, of 14 pounds to the stone. Our report thus spoke to his appearance in the Agricultural Hall:—"In the class of older males, we find the crack steer of the show, Mr. Heath's silver cup or *quondam* gold-medal ox, the best male animal in all the cattle classes. This is an extraordinarily great and grand specimen of the breed—very large in frame, broad, deep, wonderfully straight, level, and heavily-covered at every good point; with a girth of 9 feet 4 inches. Unfortunately, this true ox was off his legs, and even on the Monday was evidently doubling up: but when seen on all-fours, his appearance was very taking, his bone fine, head handsome, coat of the right character, and handling indicative of superb beef."

PLATE VI.

QUEEN BERTHA; A THOROUGH-BRED FILLY.

THE PROPERTY OF LORD FALMOUTH.

Queen Bertha, bred by Lord Falmouth in 1860, is by Kingston out of Flax, by Surplice, her dam Odessa, by Sultan—Sister to Cobweb by Phantom.

Kingston, bred by General Peel in 1849, was by Venison out of Queen Anne, by Slane. Recommended alike by his good looks, his good blood, and good performances, Kingston was a very promising stallion, although he never exactly fulfilled this until too late, as Caractacus a winner of the Derby, and Queen Bertha winner of the Oaks, are both posthumous produce. Kingston died at Middle Park, Eltham, in February 1861, having from his first season at the stud been in the possession of Mr. Blenkiron.

Flax, bred by Mr. Blenkiron in 1855, was sold at one of the earliest of the Eltham yearling sales

to Lord Falmouth. The filly, however, never ran, but went to the stud at three years old, throwing Queen Bertha as her second foal.

Queen Bertha is a mealy bay mare, standing close upon sixteen hands high. She has a plain, coarse head, with wide lop ears, and a light straight neck. Indeed, so far she does not begin well, taking but little after her handsome sire. She has, however, fine oblique shoulders, immense depth of girth, and a big barrel; with a good back and powerful quarters, but rather thin thighs and gaskins. Her hocks and knees are well developed, and with plenty of bone, Queen Bertha is altogether a great, powerful filly, with a rare raking stride of her own; but by no means a beauty to the eye, study her from what point of the compass you will.

THE USE OF COMMON SALT ON THE FARM.

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

There is hardly any saline substance whose value in agriculture has been more the subject of contention than common salt. It did not long, however, escape the attention of mankind, that its use was essential to their health, that herbivorous animals sought it with avidity; and that this craving for salt is not confined to our domestic animals, but is equally possessed by those in a state of nature.

Then again, from the earliest times there has existed an opinion that salt possesses fertilizing powers. This seems alluded to by St. Luke (ch. xiv., ver. 34). It was two centuries previously that M. P. Cato had recommended it for cattle.

Within the last few years the use of salt as a manure has been gradually extending. On many soils, especially those of light description, it produces very good results, and it is certainly one of the cheapest of our artificial dressings. It is always desirable to understand the chemistry of our proceedings. Now, in the case of common salt we must be content with but few additions to our stock of knowledge since I some years since addressed the English farmer on its uses. Its value to the agriculturist I then attempted to class under five heads, viz.—1. The property of salt, in small proportions, of promoting the decomposition of the animal and vegetable remains contained in all cultivated soils. 2. Its noxious effect on insect vermin, and its tendency, when copiously applied to fallows, of aiding in the destruction of weeds. 3. Its being in small proportions a direct food of plants. 4. Its power to preserve the juices of plants, and the soils on which they grow, from the effects of sudden transitions in the temperature of the atmosphere. 5. The increased power which it imparts to a soil, of absorbing the moisture of the atmosphere. It is evident from more recent researches, to which I shall presently allude, that the trials of the last few years, far from producing any material alteration in our view of these five powers assigned to salt, have rather tended to strengthen them. It has been found, for example, that common salt enters into the composition of the mineral matters of mangold and some other crops, in a much larger proportion than was formerly understood. We find from the analysis of this root by Way (*Jour. Roy. Agri. Soc.*, vol. viii., p. 185), that 100 parts of the bulbs of three varieties of the mangold contain of ash—

Yellow globe.....	1.02
Long red (specimen No. 1).....	0.64
Ditto (specimen No. 2)	1.00

One hundred parts of these ashes contained :

	Yellow Globe.	Long red. No. 1.	No. 2.
Silica	2.22	1.40	4.11
Sulphuric acid....	4.49	1.65	3.11
Sulphuric acid	3.68	3.14	3.31
Carbonic acid.....	18.14	15.23	21.61
Lime	1.78	1.90	2.17
Magnesia.....	1.75	1.79	2.79
Peroxide of iron....	0.74	0.52	0.56
Potash	23.54	21.88	29.05
Soda.....	19.08	3.18	19.05
Common salt	24.54	49.61	14.18

The farmer will note that the ashes of these three specimens (which were grown by the Rev. A. Huxtable, in Dorsetshire, on a mouldy soil, resting specimens, Nos. 1 and 2 on chalk, and No. 3 on yellow clay) contained more than 14, 24, and 49 per cent. of common salt. The ashes of the leaves of the best also were found to contain an equally large proportion; 100 parts of the ashes of the leaves of the

Yellow globe containing.....	37.66 parts.
Long red (specimen No. 1)	34.39 "
Ditto (specimen No. 2)	33.96 "

So that from the mean of these three specimens, we find that one ton of the fresh bulbs of the mangold root contains of common salt 5.29 lbs., and one ton of their leaves 12.82lb. The farmer's other extensively cultivated root crops also contain common salt in very sensible and probably equally essential proportions, although to a smaller extent than that of the mangold. For we find (*Farmers' Almanac*, 1848, p. 11), that there are contained of common salt, in one ton of the bulbs of the

Turnip	1.49 lb.
Carrot	1.42 "
Mangold	5.90 "

It would seem, however, like those of the mangold, the tops of the carrots and turnip contain more common salt than the bulbs, for it was found that, upon an average, one ton of the entire plant, bulbs and tops, contained of it (*ibid*)—

Turnip	2.37 lb.
Carrot	3.53 "
Mangold	6.51 "

In 100 parts of the ashes of several varieties of the potato, Professor Asherson has found the following proportions of common salt (*Trans. High. Soc.*, 1863, p. 47), viz. :

Regents	2.07
Dalmahoy	3.44
Skerry blues	2.24
White rocks	2.76
Orkney reds	3.02
Flukes	2.14

The proportion of common salt found in the seeds of the cereal grasses is much less considerable, and in some varieties analyzed by Mr. Way it seemed totally absent. This would appear, however, to be influenced by the nature of the soil on which it grew, for 100 parts of the ashes of the seeds of the Hopetoun wheat, grown upon (*ibid*, p. 43)

Clay, contained.....	1.60
Chalk.....	0.84
Stonebrash.....	0.00
Siliceous sand	0.00

And in the ash of the seeds of the Chevalier barley he could not detect any common salt, but in that from some Moldavian he found 0.93 per cent. In the ash of the seeds of some Poland oats he could not find any salt, but in some Hopetoun he found a trace, and in the ashes of the chaff 1.24 per cent. It is very probable that this proportion of common salt varies

very considerably in different specimens, and according to the circumstances in which the plant is placed; but in whatever proportion it is found, however small, we have no reason to conclude that its presence is merely accidental and unattended with benefit to the growth of the plant.

It is remarkable, too, that the wheat plant will flourish in soils in which salt is found in very large proportions. Mr. Josiah Parkes some years since alluded to this fact (*Jour. Roy. Ag. Soc.*, vol. vii., p. 268); as he remarked the quantity of salt in which the wheat plant will flourish is curiously illustrated in the warp soils about Patrington: in fact, it would be hardly credited unless seen. The whole surface of a large reclaimed warp piece on Mr. Marshall's estate was planted with wheat for the first time in the autumn of 1844. In the autumn of 1845 the surface of the ground was crystallized all over with salt, evincing the large quantity which the soil must have contained, yet from this first crop the tenant thrashed out 24 bushels per acre. The existence of a considerable amount of salt in the wheat grown on certain soils reclaimed from the sea around Wexford Harbour is alluded to by Mr. Edward Carroll, of Fermoy, in a recent report (*Agri. Gazette*, 1864, p. 431). He observes that on these extensive mudlands, when but partially reclaimed, there were extensive crops of various kinds grown, but of wheat more especially, and to such an extent was salt found in the wheat grains, which were in all other respects of the finest samples, that some of the millers objected to buy them. Of the application of salt to the land, Mr. Carroll, speaking as a practical man, after many years' experience, observes: "I believe salt to be indispensable, on many rich loamy lands, to give strength to the straw, but that if used extensively on heavy, wet, or undrained lands it will prove injurious to most crops in their early growth, especially during cold, wet seasons."

From these chemical researches we should be prepared to conclude (after noting the amount of common salt on its root and leaves), that mangold would be especially benefited by an application of salt. The testimony of many skillful farmers proves that such is the case. To refer to an instance or two: The following experiments were conducted by Mr. W. Horn, of Scols, in Suffolk, in order to ascertain which manures would raise the greatest weight per acre of mangold, in conjunction with farm-yard dung. Field, a light soil; seed drilled on 27-inch ridges first week in May. Dung applied in the ridge at the time of sowing; the artificials sown by hand over the dung, to ensure equal distribution. Crop stored in the second week of October (*Trans. High. Soc.*, 1862, p. 214):

Manure per acre.	Produce.	
	Tons.	Cwt.
20 cart loads of good dung	16	4
20 cart loads of good dung, 2 cwt. guano, and 4 cwt. of salt	28	14
20 cart loads of good dung, 4 cwt. blood and bone manure, and 4 cwt. salt.	24	9
20 cart loads of good dung, and 2 cwt. of guano	21	15
20 cart loads of good dung, 4 cwt. superphosphate, and 4 cwt. salt	23	10
20 cart loads of good dung and 4 cwt. salt ..	20	4
20 cart loads of good dung and 4 cwt. Lawes's superphosphate	18	10
20 cart loads of good dung, 4 cwt. Lawes's superphosphate, and 4 cwt. salt	21	10

The testimony of a celebrated Norfolk farmer, Mr. James Hudson, of Castle Aere, is still more valuable. He reported to me some time since: "My practice is to apply per acre upon this farm of 800 acres of arable land, and 900 acres of pasture and meadow, fertilizing substances as follows:

FOR WURREL.

	£	s.	d.
10 three-horse cart loads of farm-yard manure			
3 cwt. of Peruvian guano at 18s.	1	19	0
3 " common salt " 1s.	0	3	0
2½ " superphosphate of lime at 6s. 6d.	0	16	6
	<hr/>		
		8	8

FOR WHITE TURNIPS.

10 three-horse cart loads of farm-yard manure			
3 cwt. of superphosphate of lime.	1	0	0

FOR SWEDES.

10 three-horse cart loads of farm-yard manure			
3 cwt. of superphosphate of lime.	1	0	0

FOR WHEAT.

8 loads of farm-yard manure as soon as the hay is off, and in February or March a top-dressing of			
1½ cwt. of Peruvian guano	1	0	0
½ " nitrate of soda.	0	7	6
2 " common salt (put on with Chambers's manure distributor)	0	2	0
	<hr/>		
		9	6

FOR BARLEY AFTER WHEAT.

2½ cwt. of Peruvian guano	1	12	6
2 " common salt	0	2	0
	<hr/>		
		14	6

For clover, trefoll, and suckling, I consider the best dressing is about ten loads of good rich farm-yard manure, soon after the corn crop is off, say in September, and if that is not to be had, a dressing with Chambers's manure distributor of

1 cwt. of guano	£0	18	4
1 cwt. of nitrate of soda.	0	14	2
2 cwt. of common salt.	0	2	0

being an outlay for the grasses of about £1 9 6 per acre for artificial manures."

The soils farmed by Mr. Horn and Mr. J. Hudson are of a light description: on heavy soils salt has not been commonly so successfully employed. I am quite indeed prepared to agree with Professor Voelcker, when he remarks (*Jour. Roy. Ag. Soc.*, vol. xxv., p. 241), that "observations on a large scale have convinced me, that the nature of the soil has a great deal to do with the success, or failure, in all cases where salt is tried as a manure." The Professor then gives an account of some trials with salt for mangolds, in 1862, on a stiff clay soil. The result of these experiments was per acre as follows: The field was in clover in 1860, had a good dressing of dung for wheat in 1861, and was in capital order for the roots in 1862.

Salt applied per acre.	Produce per acre.	
	Tons.	Cwt.
None	15	9
1 cwt.	16	13
2	16	4
3	14	13
4	14	15
5	18	4
6	16	19
7	14	8
8	14	16

In commenting upon these trials Dr. Voelcker observes: "It is well to bear in mind that the soil of the experimental field is a stiff calcareous clay. On land of that character, common salt, if I am not mistaken, seldom produces any good effect; whilst on sandy

soils, if my experience teaches me true, it is generally applied with great success."

We have been hitherto considering the use of salt applied as a fertilizer in the state in which it is usually procurable for domestic purposes.

There are, however, several useful impure varieties met with in commerce. These are sometimes of superior value to the agriculturist. For instance, there is the refuse salt of the Cornish pilchard fishery. This commonly contains the yellow-coloured oil, scales, &c. of the fish in considerable proportions. These add, of course, to the fertilizing powers of the salt. Another variety is that produced in considerable proportions, during the manufacture, from kelp, of the salts of potash, iodine, &c. A specimen of this impure mixture of salts has been lately analyzed by Professor Anderson; he describes it (*Trans. High. Soc.* 1864, p. 245) as always containing a certain proportion of carbonate of soda, and also some sulphate of potash, which latter substance is likely to make it useful as a manure; one hundred parts taken from a very large quantity were found to contain

Water.....	17.15
Sulphate of potash	6.66
Sulphate of soda	10.40
Carbonate of soda.....	14.50
Common salt.....	51.09
Insoluble matter	0.20

100.00

"A substance," adds the Professor, "containing 6 per cent. of sulphate of potash, and 10 per cent. of sulphate of soda, merits a trial as a manure, and ought to be useful, where a supply of alkaline salts is required. It may be noticed that this kelp salt contains also 14 per cent. of carbonate of soda, regarding the action of which on vegetation nothing is at present known. Although it is doubtful whether that substance would be of much use to the plant, it is reasonable to expect that it should, at all events, produce some effect on the soils, and promote the decomposition of some of the organic and mineral matters contained in it. An experiment with pure carbonate of soda would be of much interest, and it might easily be made at no great cost.

"I am not aware of any decisive experiments with soda; for in the various successful experiments with soap-studs, the ashes of sea-weeds, &c., soda only formed a portion of the dressing. There is reason however to believe that soda possesses a considerable value as a top-dressing. The ashes of sea-weed, in which it abounds, have long been extensively employed for this purpose in the Channel Islands, where it is called varech; when used for wheat it is considered by the Jersey and Guernsey farmers to give fulness to the ear, and strength to the straw. The common soda, so extensively used for domestic purposes, is now obtainable at a very reasonable rate; but perhaps a still more economical plan is that of thoroughly mixing together, in a dry state, two parts of hot lime and one part of common salt, and allowing the mass to remain incorporated under cover for two or three months; by this process a gradual decomposition takes place; muriate of lime and soda are formed, the heap gradually becoming encrusted with this alkali."

Salt is also very useful when mixed with pond mud, ditch-scrappings, or weeds, in the proportion of about 56lbs. of salt to a cubic yard of the refuse matter. These should be well mixed together, and allowed to remain for twelve months before they are spread upon the land. In this time the weeds and their seeds are killed. It is a still better plan to well mix with the

salt double its weight of quicklime before it is applied to the heap of weeds or earth.

Salt acts very usefully as a fertilizer when mixed with substances containing ammoniacal salts. It has been in this way successfully used with farm-yard manure, with Peruvian guano, and with soot.

Mixed with soot (soot containing about 1.25 per cent. of ammonia) salt has been found to produce a remarkably good effect. This was shown more than half-a-century since to be the case with potatoes.

George Sinclair, of Woburn, in his "Prize Essay on Salt Manure," mentions it as "remarkable" in the case of carrots. Many others have done the same with a regard to wheat. In Sinclair's experiments upon carrots,

	Tons.	cwt.	lbs.
The soils without any manure produced carrots, per acre	23	9	107
Soil with 6½ bushels of salt dug in....	44	14	17
Soil with 6½ bushels of salt and 6½ soot, ditto.....	40	4	97

The mixture is evidently well adapted to the increased production of carrots. In some trials of Mr. Aynealey, of Tockington (*Jour. Roy. Ag. Soc.* vol. iv. p. 270), on a clayey loam resting on clay, the following were the results per acre:—

	Red Carrots.		Belgian Carrots.	
	Tons.	cwt.	Tons.	cwt.
Salt 6½	22	8	29	8
Soot 54	19	5	25	0
Coal ashes 24 tons	21	3	27	4
Rape dust 8 cwt.	21	1	26	1
Bone dust 24 bush.	21	18	28	8

The use of salt for live stock, as I have before remarked, has been known from a very early period. The amount of it now often given to our domestic animals varies considerably. One good plan is to have lumps of rock salt so placed that the animal can help itself. When it is mixed with the food, varying amounts are employed.

In Belgium, where there is a tax upon salt, it is allowed to be used by the farmer duty free, and for this purpose he is granted a certain daily amount for each animal; but to prevent the salt being used for culinary purposes, it is previously mixed with a proportion of gypsum or chalk. The Government allowance in that kingdom is as follow (*Dr. Phipson's Prize Essay on Salt*, ante vol. liv., p. 333):—

For an ox per diem	2. oz.
For a horse.....	1.

"In many of our best-farmed districts," adds Dr. Phipson, "we find the daily allowance of salt is about as follows:—

For a calf six months old	1 oz.
bullock or cow one year old	3 oz.
ox fattening.....	6 oz.
milch cow	4 oz.
sheep (every fifth day)	0½ oz.

"It should be borne in mind that an excess of salt is injurious to any animal; and that is why I have given the preceding figures as a kind of practical guide. An

excess of salt produces irritation and inflammation of the mucous membrane, and causes several kinds of skin-disease, especially in sheep. With horses, an excess of salt has been known to produce dysentery; and in oxen, diseases of the blood.

"Considered as a medicine, salt purges animals in the following doses:—

Horses	8 to 10 ounces
Oxen	10 to 16 "
Sheep	2 to 3 "
Figs	2 to 3 "
Dogs	1 to 2 "

"It becomes a poison in the following doses:—

Horses	2lbs.
Oxen	3lbs.
Sheep	6 to 8 ounces
Figs	4 to 6 "

It is evident then, that salt possesses a very considerable agricultural value, not only for stock, but as an adjunct to several other manures. And when we remember that it may be procured in any quantity at our great salt works, for I believe, less than 10s. per ton, we can hardly avoid the conclusion that it might be far more extensively and profitably used in agriculture.

THE FARM HOUSE:

THE COTTAGE, AND FARM OFFICES.

THE MATERIALS USED IN THEIR CONSTRUCTION.

We now proceed to the consideration of points connected with the arrangement and construction of the "Farm Offices or Steading."

The desire which has been manifested, during the last few years, to base the improvement of the machines and implements of the farm upon correct principles, and which has already effected such striking and beneficial changes in their construction, has naturally extended itself to the buildings of the farm, and bids fair to display, if it has not already displayed, as satisfactory results in practice. For long, long time, the buildings of the farm exemplified, as a rule, in their arrangement and construction, an utter ignorance of those principles calculated to secure economy in working, and the comfort of the animals which they were designed to shelter. And, although great improvements have been assuredly introduced of late years in the departments connected with construction, still we do not think that, as a rule, the principles of arrangement have been studied and introduced with the judgment and practical care which would have given results of a more satisfactory kind than are witnessed in many farmeries which have been erected within the last ten or fifteen years. Much of this neglect of attention to what we may call the philosophical principles of arrangement, has doubtless arisen from the planning of the buildings being entrusted to architects, and the decision of their final adoption left to agents or landlords, who, whatever may have been their merits as designers and lawyers or men of taste, were certainly not the men who could be supposed, or who should have been expected, to possess a practical knowledge of farming, and how all its requirements are to be met. Far be it from us to raise a word against the skill of architects as a body, or to suggest that farmers should not avail themselves of that skill; but it seems to us that something more is required than a knowledge, however profound, of construction, or a skill in designing, however daring and effective, in the planning of a building of so complicated a character as that of a farmery, and where the difference between a well-designed and ill-designed plan is just the difference between the practical daily working of it with a minimum of expense and trouble, and the reverse. It is not enough that the architect who is employed, or the agent or landlord who employs him, to plan a farmery, has a knowledge of the names merely of the various apartments usually required in the building. It is necessary not only that he should know the nature of the operations carried on in these, or the purposes for which they are designed: it is equally necessary that he should know whether such apartments are really

required; for to huddle a number of apartments together, as barn, cowhouse, stable, engine-house, &c., &c., is *not* designing a farm-building. Many of these apartments may not be required, and their relative arrangement or position one to another may be such as to hinder rather than promote the work of the steading. In examining some farms—so-called model—and wandering over the mazy and lengthened list of names of its apartments, we have often wondered what could possibly be the ideas of the designer as to what farming was; or in what district a building so arranged could be useful. It seems but a trite remark to offer to the reader's consideration, that the purpose for which a building is required is one of the primary points, if not the primary point, which should be considered by those proposing to erect it; but, trite as it is, how often do we find it overlooked! Each district has its own peculiar kind of farming; and this, again, may be modified in certain localities; so that an arrangement which may be all that is required in one place, may possess a superabundance or a deficiency of room in another. No one, therefore, is so well able to tell what is wanted as he who wants it—another trite-enough truism, but also often overlooked; else, how is it that farm-buildings are erected sometimes without even the tenant-farmer for whose use they are built being consulted at all, or, if consulted, consulted when too late for the designer to profit by his advice? By all means, let an architect of taste and skill be chosen; but let him be aided by the counsels and the practical knowledge of the farmer, who is the only one thoroughly acquainted with what the farming of the place requires in its farm buildings.

As regards the best *position* for the site of a farmery, much has been said, and well said; but it may all be briefly summed up in one sentence. Let it occupy the most central position of the farm, and that locally neither the highest nor the lowest part, so that steep ascents or descents are avoided; let it be where a supply of good water is obtained—not near stagnant water—and do not neglect to place it near a good road, if this can be done without the sacrifice of other important points.

Respecting the *soil* of the site, much that we have said on this subject in our paper upon the Farm-house will be useful to be remembered now. To summarise here, it is generally understood that the scale of value is thus—beginning with the highest and ending with the lowest: first, soil lying on sandstone and calcareous rocks; second, chalk; third, clayey. The ground upon which the buildings are to stand will be in the best position if it slopes very gently, so as to give the whole a *south-east aspect*.

The freer the ground is from risings and fallings, or the flatter, in the sense of its general surface, the better.

We now come to the *arrangement* of the buildings. And this naturally divides itself into two branches for consideration: first, the form in which the buildings should be built; and, second, the way in which the form so decided upon is filled up, with the various apartments which constitute it. As to *form*, then: whatever this may be, let it be compact, carefully avoiding the straggling arrangement one too often meets with; and, above all, avoid placing one part of the buildings on one side of the road, the other on the other side of it. This atrocious arrangement, if followed, will be to you a never-ending source of annoyance and loss. We are inclined to recommend our reader to adopt the form, as shown in the plan Fig. 1. This arrangement is what we may call the "self-contained" one, and possesses this, if no other advantage, that the whole premises can be secured at night. Another form is, three sides of a rectangle, as shown in the diagram Fig. 2. Another form

Fig. 1.

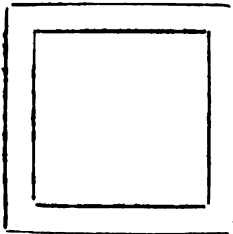
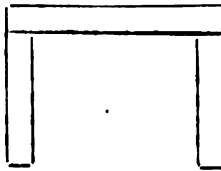


Fig. 2.



now greatly advocated, in which compactness and the principle of self-containment are pushed to their utmost, refers to what are called *covered homesteads*. We need scarcely say that there is a wide diversity of opinion as to the merits of this system. There is something in the idea, we confess, very pleasing and in conformity with the times in which we live; but, without at present entering into the pros and cons of the discussion, we may here express our decided conviction that if the walls bounding the various apartments are left short, and not carried up to the roof, or at least sufficiently high to prevent the horrible draughts which would otherwise be created and constantly maintained, perpetual annoyance will be the result. Let us remember that the domestic animals of the farm are not the rough hardy animals some seem to think they are, but subject to many diseases, and peculiarly liable to discomfort. Further, unless the cross walls within the wide-spreading roof are built up, that complete isolation of one place within it from another, necessary at all times where stock is kept, but more than ever necessary where disease breaks out, cannot be secured. On the whole, we are not at present, therefore, inclined to look upon covered buildings either as the cheapest or the best form to construct. At the conclusion of the paper

on the Farm Offices, we shall give a series of plans showing the arrangements here indicated; and also of others which have been proposed from time to time.

The *filling-up of the form* decided upon with apartments, whatever that may be, is the next point we have to consider; and certainly this has been a most prolific subject for debate and writing, and numerous and diverse withal have been the opinions broached in connection with it. That these opinions should be characterized by diversity rather than by uniformity is easily to be understood, when we consider the very widely different circumstances of farming in various localities; there are, however, certain principles upon which all may be said to be agreed, and which, therefore, may be briefly summarized. The preparation of the grain for market, and the feeding of the stock, are the two purposes for which the accommodation and the shelter of the farmery are made; and the two have a close connection with one another, for the straw required in such large bulk for the wants of the stock is produced from the thrashing of the grain which is sent to market. The straw being required at more than one part of the building—for the stock apartments are generally subdivided or spread over it—a central position for the straw-house will obviously be the best for it; and this position of the straw-barn decides that of the corn-barn; this, again, the position of the steam-engine room, and all these the position of the rick or stack-yard. The position of the driving power will obviously decide that of the room in which the driven machines used to prepare the food for stock—as straw-cutters, root-pulpers, and the like—are placed; and as different kinds of stock require different quantities of straw, those requiring the most should have their houses nearest the straw barn. To these obvious principles of arrangement of the various apartments others may be added. Economy of time and of labour will be secured by making all those apartments closely connected with one another, which are designed to aid one branch—thus all the apartments connected with the dairy processes in a dairy farm, and all those connected with the conduct of the arable part of it, should occupy different parts of the building. Further, the connection of apartments, one with another, should be studied, so that no time shall be lost in going and returning unnecessarily: to wit, the hay-house should be in close connection with the stable; the turnip stores and the cake houses should be close to the cow byre; and the cooking houses should be near the stock which uses the food cooked in them, and near, also, to the stores where that food is kept; lastly, the dung pits should be easily reached from the houses in which it is produced. These principles of arrangement being attended to, we shall, by the position of the apartments in the building, aid in the readiest and most economical way the progress of the bulky materials used as food, in the shape of straw and roots, from the point where they are consumed, to the dung-pit where the products are finally received.

ON ARTIFICIAL GRASSES.

The records of Roman agriculture have transmitted the intelligence of land being fallowed and manured; wheat-grains sown in alternation with green plants, which were used in a succulent condition, or dried into fodder; and that a plant or plants very similar to turnips were known in cultivation. The spontaneous produce of grass-lands was mown for hay, and fields were reserved for the special purpose. No information can be gathered of any grass-plants being sown in order to raise a crop of that kind of vegetables. Herba-

ceous plants had not come into use, as clovers were unknown to require a mixture of dry stems to correct the succulent nature. Another obscurity remains: if cattle or any animals were fattened for food. Swine-flesh was used, but probably with little preparation. The presumption is, that no animals were purposely fattened, and that the chief situation of cultivators was directed to the production of grains.

Of mediæval agriculture, or the cultivation of the earth during the dark ages of one thousand years, a greater igno-

rance remains than of the Roman practice. The best conclusion is, that grains were sown and used, from the former usages; that natural hay was made from grass lands; and that animals were fattened into flesh for food, by the nations of Northern Europe, on the summer pasturage of grass, and that the flesh was salted for the winter consumption. No attempts had produced an artificial food for animals during winter, and the condition was thrown back in that season as much as the summer had forwarded it. This state of agriculture remained till a new era burst upon the human race, by the establishment of education and the general use of printing.

Clover was seen in Flanders in 1645, by Sir Richard Weston, who, along with Hartlib, the author of the "Legacy," recommended the plant for green food and dried fodder, and to be sown on the best prepared land, with chalk and lime, especially after paring and burning. The plant crept into use during the next half-century; for at the time of the beginning of next century the notice is very strongly recommended as a new improvement. It would appear that the use of grass-plants had been coeval with the green plants for fodder, as ray-grass is mentioned by Worledge in his work, "Systema Agriculturae," in 1666, 1687, and 1716, which formed, in the last edition, a complete system of husbandry and gardening. Ray-grass is called a new improvement, which takes in all sorts of lands, endures summer drought, and is in spring the earliest grass. Kept down, it is sweet, and beloved by cattle. Best for horses' hay, and sown in two bushels of seed on an acre, and three bushels is not too much. Being a thin, spiry grass, it requires to be thickened with others; and after then it comes in for a large crop, and takes the precedence of all other grasses.

Nourse, who wrote a work called "Campania Felix" in 1700, designates ray-grass as a spiry, benty sort of grass, and thrives on a variety of soils. The expediency had very early appeared of joining with the innocuous clover a grass-plant of dry stems and leafy herbage, to procure a mixture of qualities in the dried fodder of hay. And in the selection of ray-grass the observation had been penetrating and the judgment sound, for the promises of one hundred and fifty years has not discovered any equal from the conjoined investigations of science and experience. Having been the first in use, and being yet the foremost in value, the following dissertation gives it the precedence of notice, and followed by the other plants in rank of estimated value. Scientific nomenclature is wholly abandoned, and the natural properties used for distinction, as they occur to the eye of simple observation, and are capable of an easy comprehension. Science, sailing in its lofty vessel on its own explored ocean, of inaccessible depth, forgets that humble disciples cannot embark without a boat, and that its walk is beyond the tread of common use and ordinary acquirement. This objection shall be most carefully avoided, by placing every statement on the level of an easy understanding.

Grass plants are distinguished by the essential character of a hollow stem with joints, each of which is sheathed by a leaf, narrow, longitudinal, and pointed, simple, and undivided. The root is fibrous and creeping. The hollow-jointed stem is the unerring distinction of a grass plant.

RAY GRASS

Is distinguished by an upright stem of medium height, on the top of which the seeds are placed in hollows, and pressed into the stems, which is waved and formed into a spike, that is two-rowed, containing numerous spikelets. The awns are most generally, if not wholly, absent. Several stems rise from one root, which are prostrate or oblique at the base; the joints of the stem are tumid and purplish in colour, close together near the base, wider upwards, often bent; leaves flat, smooth, pointed, dark green in colour. The spike of two rows containing the seed on the top of the stem, and the spikelets of seeds pressed into the stem, making it waved and bent, form an easy distinction of ray grass.

From the first notice of this grass plant, about 1670 or 1680, it has continued to be sown with clovers, for the purpose of growing a crop of hay, and also for pasturage in two or three years afterwards. In the first use, it stands altogether unrivalled; and in the second, it holds a high place, not being much surpassed by some few plants that are much

inferior to it for the crop of hay. The chief recommendation of ray grass, and in which property the plant surpasses any grass that is yet known, consists in the ready growth on a large variety of soils, extending from the watered meadow to the scorching sand; no other grass will afford an equal quantity and quality of produce on all the different variety of soils on which the plants are grown, and this quality may have constituted the original grounds of selection. For general use this property is invaluable. Ray grass sends up from one root several stems that rise to a moderate height, and continue to produce stems after being cut and during the season; whereas many other grasses yield only one stem throughout the summer, and after being cut do not again produce. The stems of ray grass are many, and of moderate height, avoiding a tall coarseness in a few stems, like many grass plants, and rising above a puny bulk and an inferior produce. In this respect, the ray grass bears the closest resemblance to the cultivated grain, in sending up a number of moderately tall culms, that are equally productive of seed. The analogy to cultivated grain forms a primary recommendation of any artificial grass for the purpose of hay, and with a fair attendance of leafy herbage to produce a latermath. And this quality is inherited by ray grass.

Ray grass rises above all other grass plants in producing a large quantity of sound and healthy seed that is easily gathered and very conveniently manufactured into use. The seed is of certain growth, and the culms being cut and dried as grains, little trouble is incurred by hand labour as with other seeds, beyond a gentle winnowing to cleanse the chaff. This certainty of produce and of growth, along with the readiness and convenience of manufacture, form a recommendation of much value in favour of any grass plants.

Ray grass rises early in the spring, shoots and flowers frequently during the season, flowers about the second week in June, and the seed is ripe about the same time in July. The herbage is much relished by all kinds of stock; the hay is good, and fetches the best price, and the ray grass is used with much advantage when sown in autumn along with other plants as spring feed for sheep.

Comparative experiments in the produce and quality of grasses stated the weight of herbage of ray grass on an acre to be 7,827 lbs. at the time of flowering, and at the time the seed is ripe at 14,973 lbs., and of latermath 3,403 lbs. The quantity of nutritious matter differs little at the time of flowering and when ripe and one-half in the latermath; the value at the time of flowering, and when the seed is ripe, is as 11 to 10, and to the grass of latermath as 5 to 2. It is inferior to cocksfoot as 5 to 18; to foxtail as 5 to 12, and to meadow-fescue as 5 to 17. The leaves of ray grass cut in April gave from 1,920 grains 70 grains of nutritive matter; and 100 grains of nutritive matter gave 65 of mucilage or starch, 7 of saccharum or sugar, and 28 of bitter extractive or saline matter. These statements will be received with much caution by the established practice of nearly two centuries. Scarcely any practical man will be satisfied that ray grass is inferior to cocksfoot as 5 to 18 in any one respect, the latter being a very coarse grass, and unfit for hay on good lands, and chiefly adapted for pasturage on inferior soils. If any farmer substitute cocksfoot for ray grass for a crop of hay in one year, that short trial will be sufficient to undeceive him. The same result will happen from a trial with the foxtail grass, which is shy of growth, and only productive in some peculiar situations, and the habits are chiefly for permanent use under certain circumstances. It is very difficult, almost impossible, to define the exact profitable limits of quantity and quality. The former must be got, and with as much of the latter as can be obtained; but a partial, or even a very considerable, increase of the latter would not compensate for a large diminution of the former. The greatest quantity of the two qualities combined must constitute the preference, but even in that case there are many circumstances to be taken into account.

Doubts have been entertained of the persistent perennial quality of ray grass, as it has been observed to fail in a few years in many places; and it has been supposed that the partial perennial quality has been derived from the annual variety of the plant being allowed to remain for two or three years, and from the seeds being gathered and used to save the expense of better seeds. The annual variety is used for one cut of hay, where the land is ploughed for a grain crop. It differs little in appearance from the perennial variety; but the seed is lighter, weighing only 16 to 22 lbs. per bushel,

while the former reaches 23 to 28lbs. Many practical men reckon both varieties to be great enemies to wheat, though it is hard to see on what grounds, except of bare conjecture, or of the plants drawing the same nutriment of the soil. No permanent pasture is made with sown seeds without a fair portion of ray grass, and even for water meadows the use of it is still maintained.

The modern objection to ray grass is the shooting up to stems or culms, the want of foliage, and a deficiency of latter-math; but the first only happens in upland situations and on poor soils, where any other plant would have the same tendency for on good lands ray grass grows large, leafy, and succulent, and, in many cases, it affords as good latter-math as most other plants, and forms, when sown with clovers, a very useful sward for several years. No plant is liable to greater variation from soil and situation, and hence may have arisen the different opinions of its value; and, being sown singly with clovers, it has been more exposed to observation than other grasses that are usually sown in mixtures, and seldom tried singly for one crop or for a longer duration. Coarseness is inferred from the lengthy stalks remaining uncropped, which may be kept under by early and close grazing, and other grasses are equally objectionable on that point; and ray grass produces stems during the whole season, while some grasses produce only one, and it is not yet settled if the leaves or stems of plants contain the most nutriment. Some single plant may be found superior in one or more properties, but there is no grass known on which the farmer can so much depend for a crop of hay, and experience has not found many, if any, that are more valuable for pastures or for permanent purposes. The certainty of growth produces an herbage till other plants come up to take its place; and in the best natural meadows of Britain ray grass is found to hold its place. The latter-math may be deficient, but every valuable quality is not expected in any production whatever; and the very gregarious property which the grasses inherit may clearly show the necessity of combining the plants, in order that the one may supply the defects of the other. And ray grass enjoys the merit of the first place of the varied utility.

For a crop of hay with clovers, three pecks of seed are sown on an acre, and half-a-bushel for pasturage of two and three years, and one peck for strictly permanent pastures.

Some years ago trials were made in East Lothian to reduce the quantity of ray grass sown on an acre by substituting equal quantities of other grasses, as foxtail and fescue. It was not perceived that the quantity or quality of the hay crop was increased, or in any way improved. The latter-math and sward of pasture were improved in a degree not sufficient to justify a departure from the established practice, as an expense and trouble were incurred by the new introductions.

MEADOW FESCUE

Is the plant next to the ray grass in the chief qualities of use. It is found in the richest pastures, and on lands of mostly all qualities, but preferring those of a soft and damp nature. The stems of fescue are erect, spreading, leafy, and knotty, of which the upper end carries a loose panicle of florets, branched, spreading, oblique, directed to one side; many florets, oblong, and obscurely ribbed; spikelets without awns, linear, compressed; leaves flat; root fibrous. The meadow fescue is strictly and persistently perennial—flowers about the middle of June, and ripens seeds about the end of July. The produce of an acre at the time of flowering is stated at 13,612 lbs., when the seed is ripe at 19,057 lbs.; the nutritive matter of the latter being only one-fourth of the former. 1,920 grains of leaves gave 96 grains of nutritive matter, and 100 grains of nutritive matter gave 59 of starch, 200 of sugar, and 21 of saline matter. This grass is superior to the foxtail in nutritive matter as 11 to 9, and inferior to cocksfoot as 2 to 1. When the latter-math of the fescue is reckoned, being late in flowering, it will approximate nearer to the cocksfoot, and raise it above the foxtail.

The meadow fescue grass most justly ranks next to the ray grass for the purposes of general utility. It thrives best in rather moist pastures and meadows, is early and hardy, and yields a plentiful crop of stems of a medium height. It yields much foliage, which is very sweet, and much relished by all kinds of animals, and it never becomes tufted like some other grasses. It ripens an abundance of seed, which is sound and healthy, and easily gathered, and the plant is equally valuable

for hay or alternate pastures, or for permanent meadow. For the two latter purposes it is indispensable, and for hay of one year no plant is so suitable to accompany ray grass, as it attains a size and a produce the first year that is so necessary, along with quick growth, for a purpose of short duration. For hay of one year six pounds of seed may be sown on an acre, and two pounds for strictly perennial purposes.

COCKSFOOT

Grass is the next useful plant for general purposes. The stems are two to three feet high, naked and rugged, purplish joints four or five, with very rugged sheaths that are sharply keeled. Leaves glaucous, acute, flat, spreading, rugged on both sides, with extremely minute spinules; panicle distantly and alternately branched, turned to one side; densely crowded flowers in globular tufts, one-sided. The grass is often viviparous, which frequently happens with plants that grow in high latitudes, and are much drenched with rains.

The cocksfoot grass is strictly perennial, flowers from June to August, and perfects the seeds in July. If the herbage be grazed in the spring, the seed will continue ripening throughout the months of August and September. The produce of an acre of this grass at the time of flowering is stated at 27,908lbs.; when the seed is ripe, at 26,544lbs.; and the latter-math at 11,910lbs.; the nutritive quality at the time of flowering and ripening differing very little, and that of the latter-math being one-half. The grass at the time of flowering is in value as 5 to 3 of the latter-math; when ripe, as 7 to 3; and the ripe grass to the flowering, as 7 to 5. 1,920 grains of the leaves yielded 80 grains of nutritive matter; and 100 grains of nutritive matter afforded 59 of starch, 11 of sugar, and 30 of bitter extractive or saline matter.

The cocksfoot grass is rather inferior for the purpose of hay in one year's growth. On good lands the stems grow very strong, few in number, coarse, and unfit for fodder; and the hassock tufted roots do not yield at the time of making hay a sufficient quantity of leaves to be cut. But for the purpose of being two or three years in pasture, few grasses can be compared with it, as it grows readily on moist soils, shoots early, and affords a grateful bite, yielding an abundance of seed, which is easily gathered. It is equally valuable for permanent purposes, being found in considerable abundance in all the rich pastures of Devonshire, Lincolnshire, and the Vale of Aylesbury, where, by the most careful computation, it formed at least one plant of every twenty in the composition of these celebrated pastures.

The different quality of the grass in a cultivated and in an uncultivated state affords confirmation of the notes that has often been made, that no portion of the vegetable kingdom is more liable than grasses to be affected and altered by the influences to which they are exposed. In shady places, in orchards, and on hedge-banks, the cocksfoot grass is rank, fibrous, and unpalatable to cattle; but when cultivated on open ground, the quality becomes excellent; and the crop of tufted radical leaves is abundant.

The hassocky and coarse appearance of the cocksfoot grass completely disappears when it is judiciously combined and skilfully depastured. It should be mixed, in sowing, with some of the earlier and later grasses, that the propinquity of the plants may prevent the over-spreading, and the stems must be very closely fed. Under such treatment, no one of the British grasses is more valuable. The writer of this article, during a long and very extensive experience on poor clays of different composition, had ample opportunity of witnessing the value of cocksfoot on land of a softer nature, and of the dogstail grass on lands that were harder and more arid. The cocksfoot was invaluable in affording an early and very grateful bite to ewes and lambs; and due care being used to keep down the coarse stems, by close stocking of the land, not one culm ever rose into view, and the radical foliage could scarcely be distinguished from the finer-leaved grasses by which it was surrounded. It is quite true the plant grows coarse when cultivated singly; but the gregarious property in grasses should never be forgotten, as most of them are seen to grow best together. One-fourth of a bushel is sown on an acre.

MEADOW CATTAIL, OR TIMOTHY.

Meadow catstail grass is a very valuable plant in certain situations. It is known by a stem of one to two feet high, at the top of which the seeds are fixed in a terminal spike,

crowded or very distantly panicked. It has got the name of Timothy grass from a gentleman who very much introduced it to notice. The plant is strictly perennial; flowers in the third week in June, and ripens the seeds in the end of July. At the time of flowering, an acre produced 40,837 lbs.; when ripe it yielded the same weight, but the quantity of nutritive matter was more than doubled; the lattermath yielded 9,528 lbs. on an acre, and gave the same quantity of nutritive matter as at the time of flowering; 1,920 grains of leaves yielded 80 grains of nutritive matter, and 100 grains of nutritive matter gave 74 of starch, 10 of sugar, and 16 of saline matter. The ripe crop exceeds the flowering in value as 14 to 5, which circumstance gives great value to the plant for the purpose of hay. It exceeds the foxtail in every form, except in the produce of the lattermath, an advantage that is much over-balanced by the readier growth, and the greater produce of the meadow catstail. The culms of this grass when the seed is ripe contain more nutritive matter than those of any other plants that have been submitted to experiment. For the purpose of hay in a crop of one year, its value is very great, resembling the ray grass and the fescue, in sending up a number of stems, of moderate height. The foliage is early, abundant, and grateful; and if the lattermath be deficient, and the grass be slow in growth after being cropped, the good qualities must be weighed against defects, when, in the case of this grass, it will be found that the former will preponderate. The plant must always form a large part in any mixture of grasses for permanent pasture, and for the alternate husbandry. Six pounds of seed are allowed to an acre for hay, and four for permanent purposes.

Timothy-grass is much cultivated in Sweden, and is very highly esteemed over the whole continent of North America. It thrives much on peaty lands, and under humid climates, and on all damp soils, and on those that possess a large degree of loamy softness in their composition. It is unfit for hot sands, gravels, and chalks, and for hard barren clays. The plant grows readily and abundantly, and yields much seed, of good quality, which are the chief recommendations that a grass-plant can possess.

MEADOW FOXTAIL

Is the earliest plant in the meadows and pastures, except the sweet-scented vernal grass, which being scarce, the earliest growth is seen in the foxtail. A stem, of nearly two feet high, carries on the upper end a spike of numerous flowers, simple or compound partial stalks; the awns are long on the back of the florets, and the softness of the spike distinguishes the plant from the catstail grass, which is stiff and rigid. The foxtail is erect, smooth, knee-bent, or floating; a native of Britain and of Northern Europe. The awn is often wanting.

The produce of an acre of this grass at the time of flowering is stated at 20,418 lbs., when the seed is ripe at 12,931 lbs., and the lattermath at 8,167 lbs., which bears to the flowering crop the proportional value of four to three, and to the ripe crop as eight to nine. The quantity of nutritive matter in the ripe crop and in the lattermath is nearly equal, and about double that of the flowering crop—1,920 grains of leaves yielded 96 grains of nutritive matter, and 100 grains of nutritive matter gave 64 grains of mucilage or starch, 8 of saccharine matter or sugar, and 28 of bitter extractive or saline matter. The plant flowers in April, May, and June, and ripens the seeds in June or July, according to the season of flowering. The natural propensities of this grass are earliness of growth, the good quality of the herbage, and the strictly perennial property. On the other hand, it chiefly affects low and damp situations; the seed is scarce, and the growth very shy in any situation. A large portion of the seeds is continually destroyed by the larvæ of a species of "measom," and in many spikes scarcely one seed is found perfect. The seed is consequently scarce and dear and light, and very difficult of separation for the purpose of being sown. For the essential purpose of the farmer—quickness of growth and abundance of produce, in the greatest variety of circumstances—the foxtail grass wholly fails in competition with the ray grass, fescues, catstail, and cocksfoot, either for hay or pasture for several years. For permanent purposes the plant requires very good encouragement, both in the natural quality and in the preparation of the land, and, at the same time, a very considerable degree of stiffness of texture in the soil; and even in the most favourable situations a portion of the seeds

never vegetates. The quality, in respect of nutritive matter, is superior to many grasses; the quantity of produce is much exceeded by others, and it is too much confined to one place of growth to admit a general and valuable application. It grows very abundantly where it once holds, and the lattermath is very large. The plant shoots readily, and the stems are very prolific. Extremes of dryness and of wetness are equally adverse to its growth, and it must be confined wholly to permanent purposes, and to the very best encouragement, both in the soil and in the cultivation. Four pounds of seed are sown on an acre.

DOGSTAIL

Grass is known by the florets all facing one way, on a terminal spike. The stems are several from one root, 12 to 18 inches high, simple, rigid, round, smooth; floral leaves, deeply divided into awl-shaped segments; leaves bright green, short, narrow, smooth, with long, smooth, striated sheaths. The plant is often viviparous, and a variety has been found with four rows of spikelets.

This grass is strictly perennial, a native of Britain, flowers towards the end of June, and ripens the seeds towards the end of July. An acre, at the time of flowering, yielded 6,125 lbs., when ripe 12,251 lbs., and the lattermath 3,403 lbs.; the nutritive matter in the first crop being nearly double that of the other two, which are the same, and are to the flowering crop in value as 10 to 17. 1,920 grains of the leaves of the grass yielded 88 grains of the nutritive matter.

It is a universal opinion that this grass affords an herbage of all others the most grateful to sheep and deer, and thrives on soils and in situations where any other grass can with difficulty exist. Sinclair has stated it to thrive in irrigated meadows; but the plant is certainly not suited to marshy boggy, or lowlands. It is unfit for the alternate husbandry, by reason of the smallness of the produce, the lateness and slowness of growth, and from the plants forming dense tufts at the roots. In every celebrated grazing ground it forms a very considerable portion of the herbage, and affects dry soils, especially of the clayey arid nature. The roots penetrate the ground, and consequently the plant resists drought very well, preserving a green appearance when other grasses have failed. The culms are of a very wiry nature, and refused by cattle, and are often mown by the scythe; but this defect, if it be any, is amply compensated by the dense tufts of grateful herbage that are formed at the roots. The culms are valuable for the manufacture of straw bonnets. A sward of the best quality cannot be formed without a fair mixture of dogstail grass. Four pounds of seed are sown on an acre for a pasturage of two or three years, and two pounds for permanent purposes.

The grasses now described are the plants of the first order for the purpose of hay, pasturage, and permanent meadows. For the last use, some other plants have been recommended, as contributing to form a sward, when several of the more early sowing plants may have disappeared. Some of them will now be mentioned, though with a small recommendation.

MEADOW POAS.

The meadow poas are two in number, the rough and smooth stalked plants, damp grounds producing the former, and dry lands the latter. The produce is fair of both plants for a crop of hay in the choice situations; the quality is very good, and the leaves are succulent. But the stems are few in number, and only rise once during the season, and singly from the root, and the general produce has not risen into estimation. The plants are not much noticed, except in some amateur cases of use.

BROME

Grasses are very large in the bulk of produce, but deficient in quality, and the coarseness prevents any use of the plants.

FESCUE

Grasses are used for permanent purposes in one species, or the "hard fescue," but only in strictly permanent dry pastures. Tall fescue grass is inferior for hay to the meadow fescue, that has been described.

OAT

Grasses are sparingly used, even for dry permanent pastures.

BENT

Grasses have been little used, and one species, "florin grass," soon sunk into oblivion, as it required specially very damp

grounds and a humid climate. The very small seeds are sparingly produced, and the propagation by stolons or layers created a trouble and expense that rendered any competition with many other plants to be a total failure. These objections were very easily perceived at the first publication of the use of the plant.

This notice of the artificial grasses has ranged the plants in the order of utility which has been derived from the writer's very extensive and varied experience of a long duration, and on a large variety of soils, and under various climates. It may be little contradicted by enlightened practice, and is now given as the result of observation and beneficial use.—J. D.

CHESHIRE FARMING—ITS PRESENT ASPECT AND FUTURE PROSPECTS.

The Past, Present, and Future of Cheshire Farming formed the subject of a lecture recently delivered to the members of the Over Agricultural Association by Mr. Thomas Rigby, of Feany Wood, secretary to the Association. Mr. Thomas Moreton (Marton Hall) occupied the chair, and there was a tolerably good attendance of members.

Mr. RIGBY said his remarks owed their origin partly to the somewhat cynical reflections upon their monthly discussions made by Sir Harry Mainwaring at the last public meeting of the Cheshire Agricultural Society, when he referred to the Over Agricultural Society, and described its members as self-appointed and rather self-conceited critics of the proceedings and views of their brother-farmers, and very much too forward in their advocacy of certain points which he thought decidedly adverse to their interests, instancing draining, boning, sheep-dressing, high-bred cattle, and broad-breasted bulks.

BONING AND DRAINING.—After taking a review of Cheshire farming from 1800, Mr. Rigby proceeded to say that the application of bones as a manure to grass land was the commencement of an era of progress, which continues to exert a more decided influence upon practical farming than does draining. The palpable advantage of draining any kind of pasture land without an after-dressing of bones is but small, unless it is intended to subject it to a course of tillage. As a foundation to build upon, it has many advantages. The roots of rushes, for instance, are robbed of their life-blood by it. The aeration of the soil which it causes enables it to filter out of the rains of spring and the snows of winter all the fertilising properties they contain. In wet seasons it is drier and warmer, and in dry seasons the soil immediately below the surface will be found more moist than in undrained land. But although, as a rule, the fertilising properties of bones or other manures will be more quickly assimilated in drained than in undrained land, yet their action is very beneficial, even on the wettest and coldest clay land. The immense amount of money expended annually by farmers in this application, and the high rate of interest they are willing to pay their landlords for an outlay of this kind, is a clear indication that they have a high estimate of their value, and must think a larger per-centage of profit may be realised by their aid than without them. Bones were not much used in the first thirty years of the present century. Their price was very low comparatively, but they were roughly ground, and longer in coming to profit. He had a receipt in his possession, dated May 17, 1833, for six tons of "bone waste," at 65s. per ton. The late Mr. John Marshall, of Norwich, has the credit of being the first to use it in this neighbourhood. It is said that he tested its utility by sowing part of a pasture field on his farm at Broken Cross in the form of the initials of his name, and the result was so decided that "J. M.," inscribed in living green, could be clearly seen nearly a quarter of a mile away.

SHORTHORNS.—On the subject of shorthorn cows, his (Mr. Rigby's) opinion might open more space for discussion than the other two were likely to do in the absence of Sir Harry Mainwaring, for he was free to say that he had sacrificed too much of the milking properties of their stock to beauty of colour and form, and perhaps to fattening propensities. He liked to see the mild-eyed, velvet-skinned, dole-some-looking shorthorn; and, as a feeder of beef, he did not mind how nearly the cattle he purchased were related to "Royal Dukes" and "Duchesses," or even to "Royal Batteries"; the nearer the better, the first cost being equal; but if he wanted milk and cheese, he would rather have his stock related to the short-legged, roomy-bodied, and rather thick-horned Cheshire cows of 1800, to the Ayrshire, or even the Welsh cow, and would prefer their being matched to the son of his neighbour's best milking cow than to a bull of Bates' or

of Booth's. (Hear, hear.) Shorthorned cows will sell for more money as barrens than cross-breeds, and will feed more quickly perhaps, but they cost more to purchase or to rear, and must have better keep; and as a comparison of profit and loss to the dairy farmer, he was inclined to think that the balance would be against their account, except under circumstances specially favourable to them. (Hear, hear.)

AGRICULTURAL IMPROVEMENT.—After a few words on sheep farming—the lecturer maintaining that that description of farming had realised the most sanguine expectations—Mr. Rigby said: A few years ago, Mr. Donald, the enterprising agent of Mr. R. E. E. Warburton, furnished some particulars of the progress made in the neighbourhood of Great Budworth in the previous twelve years. In 1844, on 800 acres, 276 cows were kept; in 1856, on the same land, 412 cows were kept. In 1845, 220 cows were in the bare fallow; in 1854, none. (Hear, hear.) 996,000 draining tiles had been put in three farms, and a large sum of money expended on bones. No school in 1844; now every youth in the parish has access to education. (Hear, hear.) It is but justice to say that this progress was then in advance of the progress making in the county generally, but it is only an average report of the progress now being made in every district; and an abstract of the whole would run thus:—Since A. D. 1800, the number of stock kept in the county is at least double, if not treble; the weight of cheese made is even of greater proportion; the quantity of young stock reared even exceeds the proportion of cows in increase, and sheep have increased at least an hundredfold. Some may be ready to say that wheat is neither of so good quality nor so abundant in quantity since the practice of marling was discontinued. But we now seldom see bare fallows, and they have now only one year's rest to pay for the crop, while they generally had two. Turnips and mangolds were then almost unknown; and since the railways have offered easy access to manufacturing towns, what potatoes have not been sent there? most, if not all, of which is due to the practice of draining and boning. Looking at the great competition there is for farms, we might infer that the prospects for farmers were most cheering. Let but the faintest whisper of a farm being "to let" be uttered, and applicants from would-be tenants literally pour in upon the agent or owner, who has only to name his rent. This state of things, however, does not arise from the profitable nature of the competition alone, but from the fact that every man thinks he can farm, and because every other branch of business or profession is so crowded as to necessitate incessant striving for subsistence in almost every rank and class.

FARM-LETTINGS.—The question of leases and yearly tenancy is not so clearly defined and mutually agreed upon as is desirable perhaps; but in the majority of cases, that part of the feudal relationship which begets considerations in the landlord and confidence in the tenant largely prevailed; and the cases are very rare where undue advantage is taken of a tenant's outlay and enterprise. Considering the competition there is for farms, rents are rather moderate as a rule. He had a great respect for landowners as a class, and had had to do with as honourable gentlemen as any in Cheshire as landlord and agent; and of them and of their conduct to himself as tenant he had nothing but what is commendatory to say; so he must not be supposed as speaking from any sore or ill-feeling in saying that the restrictions sometimes placed upon farmers are most injurious to their interests. When it is actually forbidden to sell hay or straw, the farm cannot be worth so much per acre to the tenant except it be of the stiffest and wettest clay. There are times when an enterprising tenant expends more of his capital in bones or draining than leaves

him enough wherewith to purchase extra stock and other requirements; and it would be more convenient to stop an extra gate and send the mowers into the field, if he were allowed to convey the hay into money (Hear, hear). Under any circumstances, it would be better both for landlord and tenant if the surplus straw of a farm was sold, and its value applied to the land in bones. A prohibition on the sale of turnips and mangolds is injurious when near a market. So, also, is the refusal to allow judicious eradication of useless fences, or cut down stunted or full-grown hedgerow trees; and the over-preservation of game and the petty annoyance of gamekeepers are rather more provocative than agreeable (Hear, hear). Then, again, an undefined position as to compensation for unexhausted improvements made upon a farm is not so satisfactory as an equally drawn agreement; nor is this in its turn so satisfactory as a liberal lease.

CHEESE.—The present prices of cheese, beef and mutton, and of wool afford the best prospects for the tenant farmer. It is fortunate that Cheshire is not corn-growing county. Wheat, at 6s. per bushel of 65lbs., is not quite so good a thing, even with the large yield of last year, as cheese at 70s. to 80s. per cwt.; and it would be their interest to increase the make, and especially to try to improve its quality (Hear, hear). Two years ago, America sent to this country very large cargoes of cheese of greatly improved quality to what she previously sent. Last year, however, the importations were very much reduced; nor did the quality equal that of the preceding year. He had extracted the following from an American paper, to show that English cheese-makers will have need to put forth their best efforts to compete profitably with American cheese in our own markets: "In the United States of America dairy-farming is rapidly extending, and greater attention is yearly bestowed upon the production of cheese suited to the English market. The principal dairy State is that of New York. By the last statistical returns, there were upwards of one million cows in that State. The quantity of butter annually produced exceeds ninety millions of pounds, whilst that of cheese amounts to nearly forty millions of pounds. The average price obtained during the last four years for choice cheese is estimated to have been 3½d. per lb.; and, at this price, the profits from dairy husbandry are stated to be higher than can be obtained from any other kind of farming produce." It is in this last sentence that we see the most serious opposition; for, with all our improvements, we should not find much profit in the manufacture of cheese at 3½d. per lb.; and yet, in the "good old times," cheese has been sold in Cheshire for even less than this. He held in his hand a sale note of a dairy of Cheshire cheese, dated January 18, 1780, which ran thus: "Jno. Bebbington bought of H-Ackerley his dairy of cheese, No. 88, 14 cwt., at 28s. 6d.—£18 19s." And our old dairymaids confess the modern practice of making cheese to ripen for market in six or eight weeks avoids the loss of weight to which they were exposed in keeping twelve months or more. Many of them aver that the winter keep of a dairy of cheese reduced its bulk as much as the loss of one row across the cheese-room. The quality of our cheese, however, is our chief concern. We have outlived the time when it was said that the pasturage of stock on boned land spoiled its flavour, and the time when the rushy land, and old rest pasture in particular, were said to be the only good cheese lands. But there is room for greater improvement; and there is the advantage that the better the quality the higher will be the price obtained, although the quantity made may be doubled and trebled. In almost every other production, large arrivals to market cause prices to fall; but cheese of first-rate quality is almost an exception to the rule, as it will displace butter and butchers' meat. But he fancied he heard some dairymaid saying, "How are we to make better cheese? Don't we always try to do our best with every cheese we make, and yet its quality varies, and won't come right?" No doubt, this is a most perplexing question, which scientific inquiry has not yet answered, and which seems to scoff at imaginary rules or principles. He was disposed to think that the making of first-class cheese is almost a natural gift—or at least that it only follows a natural aptitude for the work, accompanied by close observation and sound judgment in the arrangements

and details; and even in such cases is more likely to follow early training than any amount of after apprenticeship. The daughters and servants of a house where first-class cheese is made generally prove good dairymaids themselves; while the number of those who excel that have not had these advantages is but limited. Much may be done, however, by the exercise of care and judgment. As in cookery or confectionary, widely different results may result from the use of the same materials. We find the same necessity for the "right woman in the right place" in the dairy as for the man on the farm; and this being found, their prospects are just now of the most promising order.

GRAZERS AND CATTLE BREEDERS.—So also are the prospects of the grazier and rearer of young stock. The price of store cattle is certainly high, but so also is the price of beef and of calving cows; and so long as the two continue in the same proportion, there is no occasion for despondency.

FARM SERVANTS.—There is just one star in the horizon which does not shine with the same degree of promise—he alluded to domestic farm servants (Hear, hear). An intelligent merchant, conversing with him some years ago, remarked, "You farmers have no trouble with your servants." Perhaps they would not cordially assent to that, but when they saw the book entitled "The Greatest Plague in Life," they might surmise the subject on which such a book would treat. Certainly "our servants" are the prevailing subject of complaint. "The men are ignorant, unamannerly, conceited, neglectful, independent, and of very rambling habits after working hours; the women are all these and worse too" it is said. Of course, exceptions are admitted, "but the cases are very rare" is the reserve. Without doubt, there is much ground of complaint; but it may also be doubted whether masters and mistresses are entirely free from blame. Granting that servants are uneducated and ignorant, are these facts always kept in view? There is, as a rule, too much impatience and greater severity of censure than their shapelessness or blunderings deserve, and more neglect of their morals than is justifiable. Indeed, the complainings made in their hearing are rather calculated to exasperate them than to improve, and the remedy lies largely with masters and mistresses themselves. He had very little faith in school training, while the home influence remains what it is in the majority of cases. To be born in a cottage with only one or even two bedrooms, and to be reared in it with five or six or a dozen brothers and sisters, and with parents who have themselves been reared in the same manner, is not the best guarantee for future modesty of demeanour, of self-respect, of character. Then, the training of the servant, if there be any, in the first place, they get, is not always improving. Nor is the example of masters and mistresses always such as they may profitably imitate. In many farm-houses, all the interest taken in them is founded on the amount of work they may be got to do. In many, he was glad to say, there was an observance of the Sabbath enforced as far as practicable, and an attendance at a place of worship enjoined. But there were few who consider their sympathies and their feelings in that kindly affectionate way which, without display, makes an impression on their hearts, and ensures their interest and esteem. Some of the best managers of female servants are women who talk freely, it is true, but without undue familiarity with their maids, of their family, their friends, and their prospects; and he had invariably noticed a respectful obedience and respect on the part of the servant, commendable to both. But, in making these observations, he assumed no prerogative. His object was to incite discussion and thought, and produce a kindly consideration for their servants, in place of the wholesale condemnation now so general.

Mr. WILD (Weaverham) concurred in almost all the remarks made by Mr. Rigby during the delivery of his excellent lecture. With regard to draining, he had heard it said that the Cheshire farmer drained his land too much; but he (Mr. Wild) never yet saw a yard of over-drained land. He admitted that on some lands draining made very little improvement. If land undergoes tillage after draining, and is properly managed afterwards, it will be worth double in value. Years ago, there was a great objection to ploughing old meadow land; but he maintained at that time that such a course not only made the land hide-bound, but also hide-bound the tenant

and the landlord as well (Hear, hear). Mr. Rigby had said something about short-legged cows; now he (Mr. Wild) would not give much for a short-legged beast. Give him a beast with plenty of bone, and then something might be put on it. Nor would he give much for a thin-horned bull—the animal that has thin horns is short of muscle. He had bought Ayrshire beasts, and they had given pretty well of milk, but they were worth nothing after milking. His opinion was that the Cheshire farmer did not pay sufficient attention to the breeding of good stock, which would pay him as well as anything. He preferred confidence in landlords to leases, where it can be obtained.

Mr. MORETON (Marton) was a great supporter of draining; at the same time, he believed there was land which, if it were drained, would never pay interest on the money expended.

Mr. MORETON (Weaverham) said that land was the best bank farmers had. Too much cannot be done at it either in the way of boning or draining. Formerly, farmers used to lay down land to improve it; now they break it up (Hear, hear). He agreed with Mr. Wild that keeping land down had a tendency to make tenant, landlord, and land as well, hide-bound. Farmers ought not to be tied down to one course of tillage—they ought to have a little of everything. He was a young farmer himself, and, like them, had come to that meeting to learn rather than to speak; and his advice was to do as much at the land as they could, and they would find it a profitable investment (Hear, hear).

Mr. WILLIS (Darnhall) said no draining would pay if the drains were taken across the butts, as he had seen in some instances. Leases of fourteen years were worse than none at

all; and with regard to farm servants, he thought a great mistake was made by masters and mistresses in expecting too much from them. If the master would now and then put himself in the position of the servant, and candidly look at the relative duties of each, he would have more consideration for his servant than is often the case (Hear, hear).

Mr. MORETON (Marton) thought that a farmer could not too highly value a good servant. He was sorry to see men who had lived all their life-time on a farm turned away in their old age, and find it necessary to seek the workhouse, in which to end their last days. With regard to draining, he agreed with a previous speaker that a farmer should never cross butts if he could help it.

Mr. MOSS thought that no settled plan of draining could be laid down. Each farmer must drain according to his land. Much had been said about getting water off the land, but he should like to hear something said about the best method of getting water upon the land, for there was plenty of land short of water.

Mr. WILD said the greatest plague as to farm servants was the difficulty of keeping them at home after working hours. They had been enticed by books, newspapers, and similar things, but to no use. With regard to labourers, there was a great oversight in not taking steps to induce them to use self-exertions to raise their own position—to aim at something higher, no matter what their position may be.

After a few words from the Chairman, eulogistic of the lecture, and some observations in reply from Mr. Rigby, a vote of thanks was passed to the lecturer and the chairman, after which the meeting separated.

TEXTLESS NOTES BY A CROTCHETY FARMER.

NEW SERIES.—No. I.

So long a time has elapsed since the appearance of the last of my first series of Notes, that I cannot well draw to recollection the reason why I then decided that it should be the last. Certainly it was not on account of any lack of favour which my readers showed to my remarks on various subjects, nor to any announcement of my esteemed friend the Editor, that my rambling remarks were no longer acceptable. Possibly my last note was penned with no notion that it was in reality to be so, but was probably brought to that point by some whim, caprice, or call it what you will, which was very likely to be taken without "rhyme or reason" by so crotchety an individual as myself. Nor can I give any better reason why I now take up my pen, to give my notes to the readers of *The Times* of the agricultural press, than that I have something to say to them—a reason in sooth a good one, and one, by the way, not always truthfully to be offered by writers, or possibly by myself at times.

Now what I have in my present Note to say is in behalf of a portion of the agricultural community (if I may be allowed somewhat crotchetically to call it so) which cannot say much, or rather can say nothing, for itself—not that the members of it do not feel enough to urge them to speech, if speech were granted them withal: if so very eloquent would their speech be, if I may judge from what their looks convey to those who will take the trouble to look for them. Need I say that I refer to the dumb animals of the farm?

That portion of the agricultural community the members of which can both speak and write—some to much, some to little purpose—have been of late very considerably busy in doing both on the subject of "legislation on cattle diseases." Not now to say whether I think legislation on this point is or is not good, I am inclined rather to ask whether a little legislation for the prevention of cruelty to our farm stock would not be a slightly useful thing? For instance, circumstances have thrown farmers

very much—nay, in some cases, completely—into the power of railway companies; and while they are in one sense—so far as conveyance of stock goes—completely at their mercy, could there be no way of compelling the companies to show a little of it to the poor animals they have in their power for many hours at a time? Not just at present to say anything about the mischief done in the propagation of disease by foully dirty carriages, which a little wholesome dread of a law might prevent, would it not be a satisfactory thing to the owner of stock to know that his animals, while travelling on the railway, would be mercifully and kindly dealt with, and not treated—I was going to say, "like beasts"? After all, I may say this for they are treated in a beastly way: on which side the brutality is displayed, I leave my readers to judge.

Did you ever, my good fellow [as Christopher North assumed that all readers of *Blackwood's Magazine* were of necessity, good fellows, so in like manner do I now assume that all readers of the *Mark Lane Express* are so: hence the familiarity of the term I have used]—have you, then, my good fellow, ever been, while travelling in an excursion train, hunted off, to let other trains pass you, and kept in a siding, far from a refreshment-room, for an hour or two? While there, fretting and fuming at the delay, did you ever think how much more intense your disgust would have been, had you been boxed-up, "cribbed, cabined, and confined" with dozens of your fellow-creatures, in a filthy carriage, open to the splashing rain or exposed to the biting blast, and above all, and worse than all, tortured by the gnawings of hunger or the pangs of thirst, which you *knew* could not be alleviated before a certain number of hours elapsed? And yet this, and a thousand times worse than this, have our poor stock to suffer while travelling long distances by rail, and I may here add by water, on which mode of conveying animals I shall have a word to say before I close this Note. When I say that the usage which our stock

meet with while thus travelling is perfectly and inexcusably disgraceful, I use a mode of expression all too weak to convey a sense of the indignation raised in me, when I look back upon and ponder over the weary woful instances of animal suffering I have witnessed at railway stations and sidings. A very general and popular notion—would that it were not in any sense of the term *so* popular!—is, that cattle are such hardy animals that they will stand anything. Railway officials seem at all events to be thoroughly imbued with this notion, and assuredly do their best to try how and to what extent the animals they convey are really hardy. But, because the poor creatures appear to stand hard usage and any amount of it well, do they in reality so? Let our best animal physiologists and stock breeders answer. The truth is, that our domesticated animals are in reality such tender creatures, so keenly alive to a sense of physical discomfort, that their bodily condition is rapidly deteriorated when exposed to it. I do not say how all the *abominations* (the strongest language I can use, O reader, kind and gentle-hearted as I know you to be, is not strong enough to express my sense of indignation at the system) of the present mode of animal conveyance can be got rid of. It is one thing to point out an evil, and quite another thing to show how it can be remedied. Enough for my present purpose if I do the first, and glance but briefly at the second. First, then, I should suggest that the carriages be built with at least top covers, if not with side ones; that they be provided with proper buffers and buffer rods, by which the horrible and cruel jolting and knocking to which they are at present subjected will be avoided. This precaution I conceive to be of primary importance: for it is difficult to say what is the extent of injury done by the series of knocks which the poor animals sustain in a long journey by rail. Any one who will take the trouble to examine as I have done the external condition of truck-loads of cattle will have no difficulty to see how they are battered and bruised. Further, I should insist upon all the timber framing of the carriages to be “bull nosed”—that is, the external angles to be rounded off. This, if done, would *alone* secure a large degree of comfort to the animals. I have been pained too often to see the excoriation made in the sides and rumps of animals by rubbing against *angles* of the framing. It is difficult to form an idea of the agony which must have been endured by some animals we have seen thus placed, through the motion and the jolting of a long railway journey, jammed up as they have been against the sharp angles, and compelled to remain so through the overcrowding of the poor creatures. Again, as a matter not only securing the ease of the animals conveyed, but as a precautionary measure acting towards the prevention of the spread of contagious diseases, the carriages should be well cleaned at the end of every journey, however short that may happen to be. Further, and here I come to a most important consideration, let means be provided at each station for easily and quickly providing the animals with a *supply of water*. Solid food can be better dispensed with, although I see no reason why the animals should be tortured with hunger; but any one at all acquainted with the principles of animal physiology knows well enough *that nothing exercises so rapidly a destructive effect upon the animal tissues as thirst*. Drinking troughs should also be supplied at the termini of the railway, at which the animals may have their thirst slaked. I have often seen herds of poor animals driven through the streets and arrive at the station in a piteously worn-out and weary condition, where not a drop of water has been within their reach. Not many days ago, I saw at a terminus a lot of cattle which had been kept there waiting for a long time; and it was truly pitiful to see the helplessly hopeless way in which they attempted to snuff up a drop or two of refreshing comfort from the plashy puddles left by a water-cart which had passed that way some time before. Why

should we add to the discomfort of transit, instances of positive cruelty like this? Railway companies have certainly so much in their power that they can do very much as they like; nevertheless, the senders of stock along their lines have also much in their power, and an energetic remonstrance from their united body would do much towards modifying the abuses which at present exist in the conveyance of stock. It is assuredly the interest—I mean the pecuniary interest—of our stock breeders to see that their animals are forwarded to their destination in that high and healthy condition in which they are sent from the farm, and which to create and maintain costs so much labour, and involves so much expense and care; and it certainly seems to me to be anything but like a common-sense mode of proceeding, to bring stock up to this fine condition for the buyer, and then be so careless as to the way we send it to him, that it necessarily reaches him at a lower value than that which it had when it left the producer. Nor do I consider myself very crotchety when I say that if the principle of legislation is to be admitted as coming between producers and buyers of our farm stock, in order to ensure, as its advocates believe it will ensure, if not an immunity from disease, at least a degree of comparative immunity from it, then it would not be amiss if we extended that legislation in order to secure this same farm stock from the exercise of all unnecessary and wanton cruelty; for be assured, reader, that it is not a small thing, this endeavour to do away with all cruelty amongst us—nay, on the contrary, highly important is it, and exercising a large influence upon us individually and nationally. Never was there a truer aphorism penned than that of Seneca’s—“All cruelty springs from weakness”—and assuredly no one likes to be considered weak. The strong man, mentally strong, is always a kind one. As the frequent exercise of a set of muscles hardens and strengthens them, so, in like manner, does the exercise of cruelty tend to weaken the whole mental attributes. It is therefore of the highest importance to the farmer that his servants be free from cruelty. A man cruel to the animals of the farm will not be a valuable or trustworthy servant in any department. But other and higher considerations are connected with this question of cruelty to the lower animals. Not here to enter upon these in detail, we shall only refer to a most remarkable and suggestive question put by Mr. Ruskin in one of his most eloquent chapters, and it is this: We often enough talk of the suffering that exists around us caused by sin: do we ever think of the “suffering that exists *without* sin?” Sure am I that if this consideration was more frequently thought of, we should not see so much horrid cruelty exercised towards the lower animals, dependent as they are upon our bounty, and *trusting to our humanity*. And this last consideration reminds me that as cruelty springs from weakness, it is invariably the weakness of a *coward*. If a horse or an ox would only put forth its strength and retaliate, would our men then so readily be harsh and cruel to them? The desire to wreak our wrath upon the weak is invariably the characteristic of the bully and the coward; and although our animals are not weak, they have all the gentleness and forbearance of the weak. Often, indeed, do I wish, when I see a beast in human form ill-using an animal, that that animal *would not* be forbearing, but would put forth its strength to pay back its ill-usage. Nor can I, while seeing the piteous look of mild reproach and gentle forbearance which I know—for I have often watched it—to beam forth from a horse or ox’s eye when under cruel treatment, divest myself of the thought that a record is kept of all their sighs and sufferings, which will be brought against those who unnecessarily cause them. The very dumbness which characterizes the animals under cruel treatment—a dumbness which is all the more remarkable when we know that they can give utterance to sounds if they like—seems to me a most striking protest against the indignities they

are made to suffer. Seeing around me everywhere so many evidences of the Divine love, I cannot bring myself to think that there is no design connected with the position which the lower animals occupy with reference to ourselves. Rely upon it, whether we think so or not, we shall be one day brought to account for the abuse of the power over them which is given to us. One word more: I have said that a cruel man is always a coward, and the more unlikely the subject of his cruelty is to retaliate the more cruel the coward is; and the more earnest the appeals to his pity and forbearance, the more does he bully. The very opposite of these attributes are those which distinguish the noble-minded and generous man. It is enough for him that weakness makes its appeal to him; and if once he puts forth his strength to defend it, the higher the *trust* reposed in him by the defenceless, the more binding does he conceive the obligation to be under which he rests, to aid them. Now, I now something of the habits of the animals of the farm the generous horse and the patient ox; and I appeal to my readers, who also know them, if in every look they do not say to us, "We know that you are our lords and masters; you can, if you like, so wield your strength, or exercise your kindness, as to make us miserable by the one, or happy by the other; we know also that you have the God-like mind implanted in you, which is denied to us; so that we look for pity, *in that* for forbearance we trust." Be this fanciful or not, the fact remains that they do trust us, or the practical result is, that they *must trust* us to be kind and forbearing. What more to a generous mind need be said? It may be that I have said too much; and yet when I think of the importance of the subject in its twofold aspect commercial and moral, I feel sadly enough that either I have said too little, or having said too much, have not said it well enough to convey to the minds of my readers all I feel on it. I most earnestly trust that amidst all the talk there is now of legislation for the prevention of disease, there will be some thought given, to legislation for the prevention of cruelty to

our farm stock; the one indeed is closely connected with the other. And *when we are cruel we are silly* in a variety of ways; not the less silly when we so use our animals in transit from place to place, that we put them in the best possible position for the attacks of disease. The whole system of stock transit requires to be remodeled, for it is the cause of much suffering and disease amongst our stock.

NORM.—I have alluded in the body of my note to the transit of stock by sea. Has any of my readers crossed from one of the continental ports where numbers of cattle are shipped for the London market? And has he, may I ask, wandered from his cosy crib on the quarter-deck to mid-ships on the fore-castle, where the cattle are penned up, and while there, pondered over their condition, alike in storm and calm? If so, and if pondering prompts inquiries, these will bring out one or two facts which will not tend to raise his kind in his own estimation. First, he will find that, as a rule, no attendant is sent with the poor animals; they are shipped on board, penned up, and left to themselves till they reach our port, where they are taken in hand by the servants of the party to whom they are consigned. Secondly, no provision whatever is made by which they can be supplied with water during the voyage, no matter how long its duration or how stormy it may be. No drinking troughs could I ever find, either at the port of embarkation or disembarkation; so that having no supply before going on board, and none after coming from it, some idea of their fevered condition may be obtained when they arrive at the place where they are going to be killed. A deck passage is had enough; but when the cattle are slung below, some notion of the hell of torture in which the poor animals exist may be had. Enough has been said under this head to show what a fearful amount of cruelty is perpetrated every day around us and by us, of which many know nothing; and of those who do know it, it may be said, that knowing they do not care. "Oh, it is pitiable!" *Reform it altogether.*

IRISH AGRICULTURAL STATISTICS.

A few weeks ago we drew attention to the agricultural condition of Ireland, drawing our figures and data mainly from the report of Dr. Hancock; but we have now more full and reliable figures to work upon, in the official returns and observations on the agricultural statistics of Ireland for 1862, submitted to the Lord-Lieutenant by Mr. Donnelly, the Registrar-General. This annual Blue Book, of more than 200 pages, is filled with elaborate tabular returns and general abstracts of the extent of land under the various crops, together with the number of each description of live stock in the several counties and provinces. The number and situation of mills used for scutching flax are also given. A general *resumé* of those details will prove instructive to many readers.

The acreage of land under tillage in 1862 was thus apportioned under crops, including meadow and clover, 5,758,610 acres; grass or pasture 9,700,232 acres; fallow, 41,004 acres; woods and plantations, 817,345 acres; bog and waste unoccupied, 4,507,733 acres of the entire surface of the country, exclusive of the larger lakes, rivers, and tideways. 28.3 per cent. is stated to have been under crops of various kinds; 47.8 per cent. was occupied by pasture; 0.2 per cent. was fallow; 1.6 per cent. under woods and plantations; and 22.1 per cent. bog and waste unoccupied. In the proportionate extent of land under crops there was but little variation in 1862

compared with 1861. Wheat occupied 6.2 acres in every 100, a decrease of 0.6 per cent.; oats, 34.4 acres, an increase of 0.5 per cent.; potatoes, 17.7 acres, being a falling off of 1.6 per cent.; meadow and clover, 27 acres, an increase of 0.7 per cent.; and all other crops, 14.7 acres in every 100, or 1 per cent. more than in 1861. About 2,000,000 acres were under wheat, 1,000,000 under potatoes, 1,500,000 under meadows and clover, 856,000 under wheat, 877,000 under turnips, 192,000 under barley, and 150,000 under flax. From these figures we deduce that 44.4 acres in every 100 were under cereals; 25.7 acres under green crops, including potatoes; 2.6 acres under flax; 27 acres meadow and clover, and 0.8 acres in every 100 acres under rape.

Turning to the summary tables we find that the greatest extent of wheat sown in any year from 1856 to 1862 inclusive, was in 1857, when the area was 559,646 acres, from which year, with gradual fluctuations, it diminished to 356,321 acres in 1862. The acreage under barley, bere, and rye, taken collectively, was also greatest in 1857, the extent being 292,662 acres; in 1862 it decreased to 204,480 acres. Oats occupied a greater surface in 1856, 2,037,437 acres; in 1862 the area was 1,977,528 acres. Beans and peas decreased from 16,034 acres in 1856, to 15,202 acres in 1862. In 1862 the extent under potatoes was 1,104,704 acres, which increased to 1,200,247 in

1859, from which it decreased to 1,018,112 acres in 1862. The acreage under turnips, mangel wurzel, and other green crops collectively, fluctuated from 443,042 acres in 1856 to 463,772 in 1862. Meadow and clover increased from 1,302,787 acres in 1856 to 1,552,924 in 1862. If we look into the separate provinces, we find that in Leinster the area under cereals in 1862 was 719,217 acres, being an increase of 27,446 acres compared with the previous year. In Munster the extent was 577,071 acres in 1862, being 20,364 acres less than in 1861. Ulster had 935,774 acres, or a decrease of 7,080 acres; and in Connaught there were 321,419 acres, a diminution of 16,636 acres compared with 1861. The total extent of land under cereal crops in 1862 amounted to 2,553,481 acres, being a decrease of 71,476 acres, or 2.8 per cent. compared with the previous year. In Leinster the acreage under green crops in 1862 was 337,035; in Munster 402,310 acres; in Ulster 478,859 acres; and in Connaught 263,680 acres showing a decrease in all the provinces to the extent of 76,193 acres compared with 1861. The total area under green crops in 1862 was 1,481,884 acres.

Meadow and clover occupied 557,334 acres in 1862 in the province of Leinster, and 454,820 in Munster, being an increase of 16,861 in these two provinces. In Ulster the area was 365,801 acres, and in Connaught 174,969; both provinces having decreased to the amount of 10,143 acres.

Flax shows a net increase of 2,113 acres in 1862 compared with 1861, having increased in the province of Ulster to the extent of 3,283 acres, and decreased in the other provinces by 1,170. In order to show the variations of late years in the cultivation of flax in Ireland, so very important in a commercial point of view, it may be stated that Down has increased from 13,970 acres in 1857 to 30,532 acres in 1862; Tyrone from 14,226 acres to 24,834 in 1862. Antrim had but 4,252 acres in 1857; in 1862 the extent was 18,020 acres. The area in Londonderry was 12,376 acres in 1857; in 1862 it increased to 19,698; and so in the other counties of Ulster, although the increase in the extent was not so great, the cultivation has been progressive. Compared with 1861, there was an increased acreage in 1862 in eleven counties, and a diminution in twenty-one, resulting in a net increase of 2,113 acres in the entire country.

In Ulster there are 1,037 scutching mills, in Leinster 13, in Munster 7, and in Connaught 3. The power employed in the 1,060 mills consists of 948 water-mills, 62 steam, 24 combined power, 7 horse-mills, and 19 wind-mills.

The pasture lands of Ireland amounted in 1862 to 9,700,000 acres, or 47.8 per cent. of the total area of the country. Meath had the largest proportion of any county under grass, 60.5 per cent.; Limerick, the next in order,

had 58 per cent. The counties of Antrim, Carlow, Cork, Kerry, Kildare, Kilkenny, Leitrim, Queen's County, Roscommon, Tipperary, Wicklow, and others, had more than half their extent under pasture. In the provinces the proportion of grass lands was 52.9 acres in every 100 in Munster, in Leinster 60.8, in Connaught 46.8, and in Ulster 40.4. All the counties show an increase in the extent of land under grass in 1862 compared with 1861, with the exception of Carlow, Dublin, Fermanagh, Galway, Mayo, Sligo, and Westmeath, which exhibit a small decrease. The total number of holdings was 609,385, being a diminution of 660 compared with 1861. The number in each class is shown in the following summary:

Not exceeding 1 acre	...	...	43,716
Above 1 and not exceeding 5 acres	...	...	84,468
" 5	"	15	183,031
" 15	"	80	140,218
" 80	"	50	72,342
" 50	"	100	54,147
" 100	"	200	21,698
" 200	"	500	8,214
Above 500 acres	...	...	1,556

The total produce of the principal crops grown in 1862 was as follows:

Wheat	...	...	683,048	qrs.
Oats	...	...	7,283,400	"
Barley	...	...	661,833	"
Bere	...	...	11,537	"
Rye	...	...	21,208	"
Potatoes	...	...	2,148,402	tons.
Turnips	...	...	8,792,628	"
Mangel-wurzel	...	...	221,678	"
Cabbage	...	...	256,425	"
Flax	...	...	24,258	"
Hay	...	...	2,781,529	"

Owing to the continued wet and ungenial seasons, the estimated yield of cereals in many parts of the country was much below the average, and in several instances the crops did not arrive at maturity, especially on lands requiring drainage.

Passing, in conclusion, to the live stock in Ireland, we find that, while in 1841 the horses and mules were 576,115, in 1862 they had risen to 622,589; asses from 92,365 to 170,887. The number of cattle in 1841 was only 1,863,116; in 1862 they amounted to 3,254,890, being 1,391,774 more. Sheep advanced from 2,106,189 to 3,456,182. The number of pigs fell from 1,412,818 in 1841 to 1,154,324 in 1862, no doubt owing to the decrease in the number of small holdings. Goats have diminished; but the number of poultry has increased from 8,458,517 to 9,916,636. The aggregate value of the live stock in Ireland is given at about £32,000,000.

DESTRUCTION OF CROPS BY GAME.

The *Herts Guardian* contains an account of the devastations said to be committed by game on wheat crops on Ashridge farms, and if the statements approximate to the truth, the injury done to the tenants is of a ruinous character, and calls for an immediate remedy. It is affirmed that the wheat crops on several farms are nearly destroyed by the abundance of game. "On one farm, it is said, there are twenty rabbits to an acre. At Studham there are five farms whose damage by game is estimated at least from £750 to £800. The worst complaints

were from Whipnade and Dagnall. Farmer No. 1 had ninety acres of wheat, and has only nine standing, the rest being destroyed. No. 2 recently counted about sixty hares on a thirty-acre wheat field. No. 3 has no wheat worth naming left standing. No. 4 was desirous of ploughing up his wheat land, of which the young crops were all eaten, and sowing it with peas, but he dared not, as it would be against the system of cropping he agreed to. No. 5, a Studham farmer, has his wheat entirely gone, and No. 7 in the same parish has a wheat field

of forty acres, in which there is little more than might be seen on the back of one's hand. No. 7, at Whipnade, had nine acres of wheat, which was quite spoiled, and which he has ploughed up and sown with barley; 180 rabbits have been killed in one day. Another Whipnade farmer, No. 8, it is said has 3,000 rabbits on one farm. A Studham farmer has had to plough up much of his wheat, and that left standing will not, it is feared, produce two loads to the acre. A gentleman who farms 900 acres, No. 9, has, it is said, at least four hares and rabbits on every acre. Above sixty hares were counted in an eighteen-acre field on Tuesday evening. No. 10 has 500 hundred hares on his farm, and No. 11 a Whipnade farmer says he loses about £100 a year by game. No. 12 has ploughed up his wheat land and sown it with oats, and No. 13 estimates the damage in one field at £150. One man has killed above 300 rabbits out of one field of thirty

acres within the last six months. On one of Mr. Mark Giger's fields scarcely a blade is to be seen."

On some neighbouring estates also game abounds to an extent highly prejudicial to the interests of the tenants. One farm, close to Gaddeeden Park, is over-run with it to a degree that causes continual anxiety and vexation to the occupier.

Surely an evil of so large a magnitude, bearing so heavily on growers of crops at a time when the prices of corn are not very remunerative, and an evil too which admits of so easy a remedy, ought, in common justice, to be speedily put an end to, and we feel sure if the matter is fairly placed before the proprietors of the land, they will take immediate steps to prevent this wholesale spoliation of the property of their tenants. Of course we cannot vouch for the truth of these assertions, although we have been assured by some who have good means of knowing that the evil is not exaggerated.

BREWING IN PARIS.

It will perhaps excite some surprise when we state that a good deal of beer is brewed in Paris, and that the Parisians are becoming, to a certain extent, beer-drinkers. Thus the beer consumed during the last ten years in the French capital has been as follows:

YEAR.	QUANTITY HECT.	YEAR.	QUANTITY HECT.
1854	166,590	1859	290,381
1855	237,926	1860	329,490
1856	290,614	1861	376,214
1857	346,977	1862	349,930
1858	300,170	1863	375,105

A hectolitre, perhaps we may be excused for explaining, is 100 litres, and a litre is about an English quart. The consumption, then, in 1863 amounted to 9,378,025 gallons. Beer in Paris is burthened with a considerable octroi, the amount paid under this head having been £23,712 in 1854, £34,704 in 1855, £48,097 in 1856, £52,197 in 1857, £46,163 in 1858, £44,819 in 1859, £50,515 in 1860, £58,066 in 1861, £55,114 in 1862, and £57,009 in 1863. The beer consumed may be divided under two heads, viz., that manufactured in Paris, and that introduced into Paris; and the following table shows the relative proportions of each:

YEAR.	PARIS MANUFACTURE. HECT.	IMPORTED. HECT.
1854	112,707	53,883
1855	146,730	91,196
1856	173,930	116,684
1857	194,671	152,306
1858	160,745	149,425
1859	142,990	147,391
1860	168,170	161,320
1861	185,210	191,004
1862	152,901	197,029
1863	142,608	214,497

Although the Parisian brewing trade has thus to some extent increased its production, it will be seen that the bulk of the additional consumption has been made good from external sources. The greater part of the beer introduced into Paris comes from beyond the Rhine. Beer at Paris is still only a choice drink—first, in consequence of the high octroi duties levied; and secondly, in consequence of the luxury of the establishments at which it is consumed. In the eastern departments of France, and on the other side of the Rhine, beer is, on the contrary, a beverage which forms part

of the general alimentation of the people. It is not surprising that in these districts the fabrication has made more progress than at Paris. When the construction of the Eastern of France Railway facilitated transports, the competition of foreign beer with Parisian became very great; it further increased when the administration of the Eastern of France made special tariff arrangements at reduced rates; and it grew still more intense in 1861 when the completion of the great bridge across the Rhine at Kehl united the French and Baden systems of railways, and enabled the brewers of Munich, Frankfort, Mayence, and even Vienna to send their beers to Paris. With some few exceptions the brewers of Paris were not prepared for the struggle occasioned by this large arrival of beer from abroad; their plant was incomplete, and large and costly reforms were necessary. But the efforts which they have made have been great and continuous, and they have not shrunk before scarcely any accident, experienced workpeople having been called to Paris, while the raw materials used have been of the first quality, and have been selected without primary reference to price. Success has, on the whole, justified the efforts made, and very often the Parisian public consumes Parisian beer which the vendors "decorate" with the name of Munich or Frankfort beer, while the same individuals sometimes excuse poor foreign beer by assuring their customers that they have been disappointed as regards the deliveries which should have been made to them by railway, and that taken suddenly by surprise they have been obliged to offer beer of Parisian manufacture! This state of affairs, it is evident, arises from a prejudice in the French mind against French beer. Probably the Paris brewers did not always produce such good or pure beers as they make now, and yet they still suffer from their former shortcomings. A favourable occasion presented itself for combatting the prejudice against which they have to contend, in the International Exhibition at London in 1862. Several Paris brewers sent their products to the world's show, and accepted a contest with Germany and England. Perhaps the decision of the jury might have rehabilitated the good name of Paris beer, but unfortunately for the Parisian brewers this decision was never given, the tasting of wine samples having occupied the jury so long that the beer specimens were left unnoticed.

AGRICULTURAL EDUCATION.

SIR,—How is a knowledge of the principles and practice of modern farming to be best acquired at a moderate expense of time and money? is a question that often presents itself to a father whose son is leaving school, or to a young man desirous of changing his occupation for one that gives him "leave to breathe the morning air pure from the city smoke"—or who, having reached the years of discretion when he must choose his sphere of action, fixes his choice on the profession of his first ancestor. Perhaps the experience of one of this latter class may justify a claim for the insertion of this letter in your columns. At the recent meeting of the Royal Agricultural Society there seems to have been perfect unanimity among the speakers on the subject of how the *scientific principles* of farming can be best learned. Schools and colleges with a properly appointed staff of teachers or professors were naturally considered the only fit place for acquiring such knowledge. No such unanimity prevailed, however, as to the mode in which the practice of farming might be learned. While one speaker was convinced "that the practical education which was given on the farm to the small tenant farmer's son was much better acquired at home than upon a farm attached to a school," and considered it a mistake to attach a farm to an agricultural school, another spoke of the "advantages of letting instruction in practical farming keep pace with the education given in the school." As a question of expense, this branch of the subject chiefly interests those who found or manage such institutions, and its solution must greatly depend upon what kind of farm they think desirable. An experimental farm must always be very expensive, and is very likely to be the rock on which the whole scheme is wrecked; but an ordinary farm, well managed on the system established in the district, should be no source of extra expense, and will yet be of great value to the students. The bodily exercise and mental recreation which friends and doctors urge as so needful for the meek-eyed students of book lore can in no other case be turned to such good account; while, by a reflex action, the unusually liberal allowance of time thus spent in ensuring a *corpus sanum*, aids the progress of study by producing the *mens sana*. A striking example of the advantage of combining out-door with in-door work will be found in the very interesting paper by Mr. Senior on the half-time system as adopted in the workhouse schools of Ireland, read before the National Association for the Promotion of Social Science, and published in their "Transactions" for 1861. He tells us that in competitive examinations between the children from different schools, the prizes were generally taken by those who had only spent one half of the usual school hours over their books—the other half being spent in out-door work. In this country, unfortunately, we have few opportunities for comparing the two systems. We have many diligent students of the Natural Sciences working in London and other great cities. We have multitudes of young men scattered over the country learning practical farming; but the Royal Agricultural College is the only place where the two pursuits are carried on simultaneously on a scale sufficiently large to give the system a fair trial. Myself a student, I shall not discuss its success, but simply mention a fact that bears upon the subject discussed. At the end of our last half-yearly session, five gentlemen, of ages varying from 21 to 28 years, obtained our diploma, after a severe examination, not

only in the sciences connected with agriculture, but also in knowledge of practical farming; the examiners in this latter subject being Mr. J. C. Morton, Mr. Baldwin of Glasevin, and our own farm manager, Mr. Fletcher. Were these gentlemen questioned, I believe they would say that much of their practical knowledge was acquired on the College Farm. Of one, at least, I can speak with perfect confidence, and perhaps a simple statement of this one instance may go further than many arguments to prove that the practice and science of agriculture may be well learned together. A gentleman who has not lived previously on a farm, but who comes to the College after nine years' service at sea, though he may know much about ploughing the waters, can know nothing about the ploughing and cultivation of land; yet, after two-years' residence here, his time being divided between in-door study and out-door work, and observation on the farm, this gentleman was able, not only to pass creditable examinations in chemistry and veterinary science, but after four hours' examination in agriculture by Mr. Morton, then an equal time spent in walking and talking over the farm with Mr. Baldwin; and lastly, the same time spent in being examined by Mr. Fletcher, he obtained the testimony of each, that he had proved himself well acquainted with the subject. It may be doubted whether many pupils living on farms would be able at the end of two years to satisfy such examiners. It is not desirable, in the generality of cases, that a college course, however well improved, should be thought to make a residence with some intelligent farmer unnecessary; on the contrary, there are, undoubtedly, some advantages only to be obtained by one admitted for a time as a member of the farmer's household; and the only debated question should be, whether this part of the training ought to precede or follow the college course. I cannot, however, agree with those who would reckon among these advantages a superior method of instruction on the farm. Mr. Stephens, in his *Book of the Farm*, when speaking of the difficulties usually encountered by the young farmer in his apprenticeship, says: "The first year is generally spent almost unprofitably;" and the reason of this is, that "he cannot possibly perceive the connection between preparatory labours and their ultimate end." Many will say the farmer should remove this difficulty by giving the needful explanations, and so no doubt he will try to do; but unless he adds to the qualifications of a farmer those of a teacher, his explanation will often be too technical for the tyro; and, besides, he cannot be expected always to spare time for such work. Where, however, there is a farm-manager appointed, a part of whose stated duty it is to devote never less than one hour a day to instruction in the field, no such difficulties as the above should ever prevent the student's gaining the information he requires. The supposed difficulty in conducting such classes is purely mythical—those who appreciate the opportunity can always improve it; and if there are some who do not appreciate it, they would hardly be more likely to have knowledge forced upon them when living on a farm. Those persons have strange ideas, who think that a dozen young men can rise with the lark, in order to follow an intelligent agriculturist over a farm, while he points out the reasons why this operation is to be undertaken and that postponed, how this or that manual task should be performed, or what are the good and bad points in a sheep or beast, and yet derive little benefit in the end. After myself attending nearly a hundred such classes, I

can truly say I have not seen, even among our juniors, an illustration of that extraordinary dogma so roundly asserted by one speaker, that "wherever there were a number of lads brought together they would be sure to do anything but what they ought to do," except that when unpractised hands have held the plough, the furrow looked sometimes as if its author thought with Haydon the painter that the line of beauty was the curve. In conclusion, I can only express a hope that in considering the

question of agricultural education the Royal Agricultural Society may still hold to their motto, "Practice with Science." Let these two sisters be divided, and mutual misunderstanding and recrimination must ensue; let them be united, and neither vain empiricism nor blinded prejudice shall be able to prevent their onward march.

I am, Sir, yours obediently,

STRABOX.

Gloucester, April 80.

ON THE ECONOMY OF GRASS AND GAME FARMING.

The banal notion that the sister-country is about to be converted into a large grazing, for growing steaks and chops to John Bull, is about as big a bubble as ever was blown in Old Ireland. True enough, large farms, when properly managed, not only produce a greater weight of cattle for the shambles than the miserable small holdings of Ireland almost wholly under potatoes, but they at the same time yield more bread corn, and other produce that enter into the daily requirements of civilized life. The latter, the small cabins of the sister-country, have hitherto yielded more pork for the English market; but the United Kingdom is beginning to loathe the large quantities of mealy pork imported from this source, and to look for something better from a land naturally adapted for the growth of the best quality of neat cattle; while, on the other hand, it is high time that Ireland were learning to kitchen her own potato with something more substantial than "buttermilk." And besides this, it will not be difficult to show that permanent pasture produces a less weight of butcher-meat for the shambles than mixed husbandry, and that mixed husbandry is the golden mean between the two extremes for the future welfare of Ireland, and also for the future welfare of a very large area of the United Kingdom under permanent meadow and pasture of an inferior description, and under deer forests and game preserves.

Where lands are lying in permanent pasture they are generally stocked with grazing cattle that have been either "bought in" or housed during winter upon the produce of a different portion of the farm under arable husbandry. In both these cases the system is a conjunct one, and therefore its individual merits cannot be practically estimated apart from the common result of the two or more systems thus conjoined, and in active operation together. It is, however, a well established fact that a country lying wholly in grass, with a climate like ours, where cattle require to be housed in the winter season, produces a less weight of meat for the shambles than when conjoined with arable farms that breed large numbers of lean stock; and the reason of this need hardly be told. Where the land is rich, and where the grass is forced forwards by heavy doses of top dressing or liquid manure, and where large quantities of meadow hay are made, results approach nearer to those of mixed husbandry; but forced hay of this kind alone during the winter months is not sufficient for profitable stock management; and when corn, cake, roots, &c., are brought in as adjunct feeding materials, the system then loses its purely pastoral individuality by being conjoined with the lands that yield the corn, cake, &c. In short, the old pastoral system of our druidical ancestors has long since died out at a mature age, and the idea of a return to it is too far out of date to be seriously entertained, however keenly it may be advocated by those who, like drowning men, catch at any straw that holds out a prospect of serving their purpose.

And this is not all. The pastoral system of the patriarchal times is not the only one that is out of date, for it may truly be said that the above conjunct system is also about to go the way of all living, and may even be sooner at the dogs than some short-sighted landowners in this country and in Ireland, who are now proposing to throw down their lands (at present encumbered with pauperism and small holdings) to permanent pasture; for farmers are generally becoming more and more determined to fatten

out for the shambles all the stock they breed; so that when this becomes the universal practice, grass farming will lose much of its present popularity, even in the sister-country.

Again, the progress of thorough drainage is not only producing a change in the climate of the United Kingdom that is affecting grass farming in a twofold manner, but also in the more humid climate of the sister-country. In the first place, for example, it is rendering a large area of the country better adapted for mixed husbandry—an area which previously could only be kept in pasture of an inferior quality. In the second place, another description of grass lands are, from a drier atmosphere, becoming more liable to burn up during the summer months; consequently, they are undergoing a change to the worse that will render it necessary to break them up to aration under the steam plough, in the long run; and the sooner this is done, the better for their tenants and landowners. It is even questionable whether the best grazings in England will not be less or more deteriorated by the improvement of the climate, so as to necessitate eventually their being subjected to the plough. And, in the third place, the improvements of the breed of stock and methods of feeding indoors, summer and winter, are rendering cattle less adapted for being scorched in the burning sun of summer, while it is increasing the profits of the opposite practice, viz., house feeding.

In all these cases, and indeed in every case, artificial systems are thus fast triumphing over the natural or pastoral ones of our forefathers, however fondly we may feel disposed to cling to all that has hitherto been considered infallible about them. Even in Ireland, with her more humid climate and western shores washed by the Gulf stream, artificial systems are fast triumphing over the natural, and at so rapid a pace at the present time that the throwing down of lands to permanent pasture is a very problematical question for any landowner to adopt for future profit. It may no doubt be in some cases justified, as an intermediate step to arable husbandry under large farms, in order to consolidate small holdings and obviate agrarian outrage; but this is at the best but a poor plea for Ireland, and a still more humbling one for her misguided peasantry and those who have hitherto neglected to teach them their duty and best interest, physically, morally, and religiously, in the land of their nativity. We, for example, examined a large area of the rich grazings of Meath, which may one day cost their owners from ten to fifteen pounds per acre to reclaim them to a profitable crop-bearing state—an investment which, according to our estimate, based on experience, will return ample interest, and go far to establish trade and lay the foundation of a prosperous population. This is equally, if not more applicable to the south and west of the sister-country; but, if the peasantry are drifted across the Atlantic by blind mismanagement, as above, Ireland will, in the long run, have to import English and Scotch families to do the work of reclaiming the land, and of laying the foundation of trade and a healthy, prosperous population, upon a solid and permanent basis. This is no less a faithful exposé of the past and present, than a living volume of fruitful information to the future, that merits the timely investigation of every Irishman interested in the welfare of his native country. And this conclusion, it must also be borne in mind, applies with equal force to various districts

of the United Kingdom at one period under aration, but now fast returning to a state of nature several degrees worse than the original in primitive pastoral times.

More need not be said on the dark side of the picture. Ireland and the western counties of the United Kingdom, exposed to the Atlantic, will no doubt, when wholly brought under the most profitable system of mixed arable husbandry, continue to have, under grass, green and root crops, for stock management, a larger proportion of their superficies than those provinces that possess a less humid atmosphere, with a drier staple and subsoil. As much depends upon the bottom supply of water as upon atmospheric humidity, if not more, for much of the moisture of the atmosphere of the western counties and of the sister-country is due to evaporation from a moist staple; so that when this is cut off by deep drainage and heavier crops, that utilise a larger per-centage of water, the climatic balance will be brought more nearly to a state of equilibrium, in comparison with the drier counties, whose hygro-metrical condition is brought upwards in the opposite direction. In other words, the dry land, from deep culture, manuring, and cropping, retains more of the rain water and moisture absorbed from the atmosphere, and gives off more evaporation, than when lying in its original state; while, on the other hand, the reverse is the case with the naturally moist lands and humid climate, consequently the two approach nearer and nearer to a state of equality. This is the grand object of art, and there cannot be a doubt but she will ultimately triumph in her grand design through the instrumentality of drainage, mixture of soils, deep cultivation, solid and liquid manuring, proper cropping, &c.

The progress of art, in reclaiming the country from two extremes, viz., an excess and a deficiency of moisture, in the land and in the atmosphere, to the golden mean between the two that is best adapted for the most profitable system of mixed arable husbandry, requires to be closely watched at the present time, not only by agriculturists, but also by all branches of the industrial community. This is more especially true of Ireland, and those provinces of the United Kingdom that have fallen behind, relative to subdivided labour, trade, and population; as they require to double their diligence until they beat up and get alongside their more fortunate rivals, at present ahead in the race of improvement in every branch of industry.

In opposition to this, it may be argued that subdivided labour, trade, and population in Ireland and in the Highlands of Scotland, with some other places of the United Kingdom, is a proposition that can never be practically realised. In point of fact, we have heard it thus argued in the several provinces thus referred to; but although "far fowls have fair feathers," and "far-fetched and dear-bought is good for ladies," nothing, nevertheless, can be more suicidal on the part of the agricultural, manufacturing, and commercial classes of Ireland and the Highlands of Scotland than the plea thus advanced; for, when practically considered, it is, in the first place, effectually barring the door to subdivided labour, trade, and population, by throwing their lands wholly under the old pastoral system; and, in the second place, with their natural resources of industry thus shackled, and securely placed in the stocks, as it were, it is sitting down in beggary and supineness, and then arguing, "*We can get things so much better and cheaper from London, Paris, and the antipodes, than what we can make them at home!*" No doubt, with the progress of wealth in the British capital, and in the other great manufacturing and commercial towns of England, the Highlands of Scotland have acquired a greatly enhanced value as sporting grounds; but this is rather "a lame apologetical set-off" than a counter practical argument to the above conclusion; for, in the first place, as sporting grounds, the Highlands of Scotland are as susceptible of improvement as are the rich grazing lowlands of England and Ireland; and, in the second place, subdivided labour, trade, and population in the Highlands of Scotland, as in the lowlands of Ireland, would still further help to increase the productive value of their natural resources both as to game and cattle.

In investigating the natural resources of the country, it must be borne in mind that game, sheep, and black cattle do not derive their sustenance directly from the land, as do the ree, shamrock, and thistle; and when the proposition of an increased growth of vegetable produce, in order to support an increased number and weight of animals, is admitted, the

question of improving the land for game, sheep, and cattle naturally follows.

It will thus be seen that the progress of art in the development of the natural resources of the Highlands of Scotland and similar districts, in order to base subdivided labour, trade, population, and permanent wealth upon a solid foundation, requires to be as closely watched as in the case of the best grazing low grounds of England and Ireland; otherwise the most profitable and prosperous results cannot be attained. However counter this may run to the premature conclusions of those who cannot see, through the impenetrable mist which has hitherto rapped the heath-clad mountains of the North, any artificial means at their command for improving the natural resources of the valleys below, but the removal of the labouring classes, whose normal function it is to reclaim them and uphold them in their most productive state, the proposition of establishing trade and population may appear more extravagantly wild than the most romantic panorama of the whole landscape. But this savours more of a bygone superstition than of an enlightened practical argument; for, with the removal of the labouring classes—however antiquated they may have been, in a professional or artistic sense—art, reason, and revelation were at the same time unceremoniously tossed to the winds, and an abortive attempt made to restore the barbarous employment of our savage ancestors, changed in nothing save a name, and in the more wanton deadly havoc and slaughter with which it is carried on in modern times. Such may have its attraction and increasing value for a time; but our game laws and method of managing wild animals of this class are annually becoming more and more unpopular with the great bulk of society, on the well-founded objection that they are diametrically opposed to the best interest of all classes; consequently there cannot be a doubt that the utilitarian spirit of the age will eventually triumph, by effecting a thorough and much needed reformation in this branch of the natural resources of the country, including every province of the kingdom. It, however, applies with greater force to the Highlands of Scotland and those districts from which the industrious foot of man has been and is now being driven, in order to grow game under what has been fallaciously termed the natural, cheapest, and best system.

It may truly be said that there is not a square inch of land in the kingdom that cannot be profitably reclaimed, so as to administer more abundantly to the wants of man than when lying in its natural state. In common conversation we may talk of "waste lands," "barren lands," and so forth; but these are just so many different figures of speech of a synonymous character, all meaning that such lands are subject to improvement by artificial means. As to the old familiar interrogatory, "Will it pay?" its practical solution, like "the best proof of the pudding," is only a matter of some little experience. Silly people, it is true, are generally apt to lose sight of their money, let the enterprise upon which they are embarked be what it may; but the infallible fiat of the all-wise Creator, when He pronounced the irrevocable sentence, "Cursed is the ground, for thy sake," obviously implies that land of every kind is subject to profitable improvement by the skilful application of human industry. The counter-argument must therefore be discarded without a hearing; for although the vine cannot be profitably grown on the high hills of the far north, yet the cloudberry may, and thus contribute its luscious and cooling fruit, as an article of the highest dietetic and commercial value. We might quote hundreds of others; but under the circumstances of the case it would be superfluous to advance details in support of a proposition so self-evident as the one in question; for there is not a single product of the animal or vegetable kingdom which cannot be turned to profitable account one way or another. True enough, the purpose for which the vast majority was created may as yet be unknown to fallen man; but, granting this, it is the very reverse of a justifiable reason for throwing childish scepticism in the way of progress; for, instead of thus turning the chariot wheel backwards, it is the bounden duty of every landowner to give to Discovery every facility and encouragement to move in the opposite direction.

Under both these heads, exclusive grass and game farming, the only conclusion to be deduced is against the current inclination of the sporting world at the present time, and not in very close harmony with the opinions of the general pub-

lic, in reference to the propriety of throwing down the small holdings of Ireland into permanent pasture for cattle, and the Highlands of Scotland into deer forests and game preserves. The facts of the case, however, leave no alternative, for under the artificial system proposed, more game and cattle could be grown, together with other produce, and a vastly in-

creased population in prosperous circumstances. And this applies with equal force to sea lakes and rivers as to the land, the produce of skilfully directed industry in every case greatly exceeding that of the know-nothing do-nothing rule of the sluggish, fallaciously termed the natural system.

ENGINEER.

GRASS LAND.

ST. AUSTELL FARMERS' CLUB.

The annual meeting of the St. Austell Farmers' Club was held at Dunn's Hotel, when Mr. Oliver, of Penhallow, read the following paper on "Grass Land":—

"Grass land being at present much more profitable than arable, in consequence of the unremunerative price of grain, I take the opportunity of introducing this subject with a view of eliciting the opinions of the many practical agriculturists by whom I am surrounded. Should a farmer now-a-days, with his grumbling propensities, complain of the low price of grain—which he is certainly justified in doing—he is likely to meet with this sharp retort from consumers: "Why don't you lay your land down to grass, that we might have shamble meat cheaper? surely the price of beef and mutton is high enough!"—thinking, no doubt, in their ignorance of agriculture, that, by increasing the breadth of grass land, we should increase the quantity of stock; but, as practical agriculturists, you are fully aware that the arable land of this country will carry a much larger amount of stock, when properly cultivated, than when laid down to permanent pasture. If, therefore, in a national point of view, cereal crops will pay the expense of cultivating, such land should not be laid down permanently to grass; for, by so doing, there would be a diminution of both labour and produce. Moreover, should these suggestions be adopted, consumers in this country would find themselves rather awkwardly situated in winter, when foreign stock cannot reach our shores, if winter fattening was discontinued, as it must necessarily be, on grazing farms. Now, in treating on the subject of grass land, I do not intend to confine my observations to permanent pasture, but to grass land generally, and will commence with seeding. Previous to seeding, the land should be carefully freed from weeds; and, in order to accomplish that object, as well as to preparing a compact and suitable seed-bed, the surface should be well pulverized. In selecting seed, particular attention should be paid to the kinds of grass found to flourish, and such as are readily eaten by stock on adjacent land of similar quality; for it is surprising what effect soil and climate have on vegetation. Grasses, which are eaten by cattle with avidity of certain soils, will be rejected when grown on soils of a different character: hence the necessity of studying nature in the selection of seed. Seedsmen, however, frequently proffer a mixture regardless of the character of both soil and climate, which to me "savours strongly of the shop." I have seen many fields, that have been injudiciously seeded down for permanent pasture with these mixtures, rendered almost valueless for many years—although heavily manured—by the coarse inferior grasses domineering over the finer sorts, so that it has been found necessary to rip them again at a considerable sacrifice. Old grass land, in the light soil and humid climate of Cornwall, is generally found to abound in soft grasses, chiefly of inferior quality, ill adapted to the fat-

tening of either cattle or sheep, especially woolly soft grass (*Holcus lanatus*), which is of little value. It is, therefore, necessary to introduce some of the harder kinds of grass, such as the foxtail, cat's-tail, or Timothy grass, which appear to be well adapted to our loamy soils; cock's-foot, a grass calculated to keep the digestive organs in order; rough-stalked meadow-grass, &c. These grasses should, however, be but sparingly used with Italian and common rye, mixed with different kinds of clover (especially Cornish mall, which will remain much longer in the land than any other variety), so that when the short-lived sorts die off those which I have named, with others indigenous to the soil, may fill up the vacancy. The quantity of seed recommended by seedsmen is, I am persuaded, much too great. Grass crops suffer from being planted over-thick, in the same proportion as grain or root crops. Much care is required in sowing grass-seeds. It should be done by broadcast machines; and even then, to ensure its being rapidly sown—which is a matter of great importance—the land should be twice sown, by taking half the machine's breadth only at a turn. Rich soils, intended for permanent pasture, should be sown about the end of July, without a corn crop. Good arable land should be sown about the middle of May with a corn crop, or earlier if with wheat, and the crop be forward. Light plain land, which should be but seldom tilled, is most profitably seeded down about the middle of July, without a corn crop, adding two quarts of rapeseed per acre, which affords much keep in the autumn or following spring. I would observe, by the way, that when coarse upland pastures require to be "renewed," and are broken up for that purpose, the natural or indigenous grasses should by no means be destroyed, since grasses of a superior order cannot long exist on elevated poor land; and, while it is impossible to purchase the seed of many of the native grasses, it is more economical to propagate from plants. The manuring of grass land is a very interesting question: its effects are really wonderful. "Muck" is said to be the mother of manure. We will therefore, first consider its varied effects, which will, of course, in great measure depend on its preparation, composition, and application. This brief paper will not admit of my dilating on the two former questions; but, with regard to the latter, I would observe that, in order to improve a coarse old pasture, dung should be well fermented, or, still better, decomposed, by being previously mixed with rich calcareous or aluminous soil, and applied in the autumn, the grass being first eaten close. Should it, however, be desirable to increase the quantity, recently made and slightly fermented manure should be supplied in the spring. On rich arable land, I consider that farmyard manure is most profitably applied on the second year's grass, slightly fermented, in the spring; but, on plain arable land, I think it would be more advantageously applied in a similar man-

er to the first year's grass. As a rule, I am decidedly of opinion that farmyard manure is most profitably applied to grass land, taking into consideration the facilities afforded or its application, in the autumn and spring, when teams would frequently be unemployed—economy of labour being a matter of great importance. Many persons are of opinion that when dung is applied to the surface of land much of its manuring properties escape into the atmosphere. Experience and observation have, however, long taught me to think otherwise; and Professor Voelcker has lately, by a series of experiments, distinctly proved that it is benefited by exposure. Some years since, I manured a field, in February, with recently-made yard manure. We had a continuance of cold dry wind for about two months after. During that time the manure was frequently brush-arrowed, so that it had the appearance of short, dry straw; nevertheless, its effect was manifest long before any rain fell, and afterwards it was extraordinary—so much so, that I feel confident that I never applied manure to greater advantage. Lime is, no doubt, a valuable rectifier of rich old grass lands, by acting upon and decomposing inert vegetable matter, and neutralizing acidity; but I consider it to be much more valuable when mixed with salt, having seen some wonderful effects from the application of that compound, to which sand is a great acquisition. I mix equal quantities of fish salt and quicklime, and then cover the heap with half the quantity of sea sand, which prevents evaporation, fermentation being very great for many days; but, when it has subsided, I mix the whole well together, and subsequently apply it to the land by means of a manure distributor, with great effect. If land be mossy, it should be well harrowed with a close short-tined harrow previous to spreading the manure, and subsequently be chain-arrowed and rolled. Peruvian guano and nitrate of soda are both very stimulating manures for grass land; but, since they have a tendency to promote the growth of coarse grass, old pastures so manured in the spring should be eaten close with stock up to the middle of June, in order that the finer grasses may have an opportunity of taking their place, or the pasture is sure to become coarse, when the manure is frequently blamed instead of the management. Grass produced by these manures is readily eaten by both cattle and sheep. Bone, however, I consider to be generally the best manure for grass land in Cornwall, our humid climate being rather calculated to produce quantity than quality; and, since a large amount of dairy produce and young stock is annually exported, requiring, for its production, a large quantity of bone-earth, that constituent must necessarily be employed to keep up the fertility of the soil; for, although there may not be a very perceptible falling-off in the quantity of grass, the quality frequently becomes inferior, from want of phosphate of lime, which, no doubt, is also essential to the health of stock. There are many instances in this county where the judicious application of bone manure has caused old grass land to carry double the quantity of stock that it formerly did, and that, too, of very superior quality. Previous to application, bones should, if convenient, be slightly decomposed, either by fermentation, by mixing with the heap a quantity of quid manure, the mass being well covered for a time by shes or mould, which, when fermentation has ceased, should be carefully mixed, or sulphuric acid may also be used for the purpose; or it may advantageously be mixed, some months previous to being spread on the land, with clay-soil or the cleaning of ditches. Bone manure should be applied early in spring, old grass land being well harrowed before and after. Such land should subsequently be cut for hay, since the bone will for a time interfere with the edging of stock; and long grass has a tendency to fix and dry the undecomposed pieces of bone. Adulteration is, no doubt, a great check to the application of artificial manure generally, which, in many cases, is difficult to detect, save in the deficiency of our crops. The safest plan, therefore, is to patronize respectable manufacturers, and not suffer ourselves to be gulled by vendors offering cheap goods, which are not unfrequently nasty. The stocking or cutting of grass land requires some consideration, which will, of course, depend greatly on its character. I consider, however, that, under all circumstances, it is unwise to eat young seed plants with sheep until they have taken a firm hold on the land, since sheep are apt, by biting close, to

pull up a considerable number and injure others. Young cattle are therefore preferable to take the first cropping, since, while fastening the land, they do not bite close. Grass intended for permanent pasture should not be cut the first year, but be stocked close, in order that the finer grasses may have an opportunity of taking their place, which are frequently smothered when the crop is cut. Old pasture land should be occasionally mown, but, in all cases, early; otherwise rank grasses are sure to predominate over the finer varieties, and the sward consequently becomes coarse. On shallow, quick, arable land, the first year's seeds should be cut. If eaten, the land, being exposed to the scorching sun, frequently produces but a light crop of grass, while, if shaded, it would have produced a heavy crop of hay. The mechanical condition of grass land is a subject worthy of notice, since it has great effect on the character of its produce—light land being congenial to the growth of bent and inferior grasses generally, while firm land is favourable to the leguminous grasses and those containing the largest amount of nutriment. I therefore consider it prudent to stock our dry old pastures heavily with mixed stock during the winter, and find that the part which gets the greatest amount of treading invariably produces the best quality of grass the following summer. My old pastures, at Treecowe, are frequently infested with the grub of the cockchafer and other worms, which render portions of the land very light, thereby exposing themselves to the prey of rooks, and, at times, apparently destroy all the grass of a considerable breadth of land; but for many years past, on discovering the location of the grub—which is perceptible from the dry coarse nature of the grass—when the land is very wet in winter, I have roots carted on it, and there consumed by cattle, treading the land very firm, which entirely destroys the baneful effects of the insect, and causes the land to produce grass of superior quality for many years. Grass land is frequently rendered too light through the instrumentality of earth-worms, by driving into the subsoil and depositing the fine mould on the surface—a valuable process if kept within bounds, but, like miners generally, they are apt to do great injury by cutting off a sufficient supply of water. They must, therefore, either be destroyed or their effects counteracted by some mechanical means. The mole is, no doubt, very useful in destroying grub and various kinds of worm which injure our cultivated crops. Moles will occupy land no longer than they find food. I have seen many crops of both grain and roots saved through their instrumentality, but am not aware that I ever saw one injured by them. The chain-harrow is an excellent implement for spreading the earth deposited by them on the surface. Nature's little drainers, the earthworm and the mole, bring to mind the necessity of draining wet land previous to laying it down to grass. Stagnant water not only prevents the growth of superior grasses, but promotes the growth of those of an opposite character. All wet low land should, therefore, be drained and trench-ploughed previous to being laid down to permanent pasture. In conclusion, I would observe that I consider it desirable, with the existing price of agricultural produce and labour, to increase the breadth of grass land in Cornwall in the following manner: 1st: By allowing arable land to remain four or five years out to grass, instead of breaking it up at the end of two or three years, as is now commonly done. By adopting that plan, much better crops would be grown than at present, and there would be less complaint of clover-sick land, rotten roots, and light grain; while the expense of cultivation would be considerably diminished. Much land in Cornwall would produce good pasture for four or five years, that is not sufficiently strong to lay down permanently to advantage. 2nd: A considerable quantity of our elevated thin soils, kept under the plough, certainly cannot be profitably cultivated with the present price of grain. Such land should be boned, laid down to grass, and not tilled, save with the view of renewing the pasture; and that should not be hastily done, since the decay of certain grasses frequently makes room for those of a superior order. 3rd: Much of our deepest, best arable land might undoubtedly be laid down to permanent pasture with advantage; but, since laying down land for permanent pasture is an expensive process, and is a permanent improvement to the farm, enhancing its rental value, I consider that it is only fair and reasonable that landlords should assist their tenants in accomplishing

this desirable object, by supplying the necessary quantity of bone manure, the tenant paying, say, 5 per cent. on the outlay. If that system was adopted, the value of an immense quantity of land in this county might be doubled;

whilst landlords, their tenantry, and the community at large, would be greatly benefited. Permanent improvements are certainly the duty of landowners, and not of tenant farmers.

ON THE PECUNIARY, PHYSICAL, AND INTRINSIC VALUE OF FARM LABOUR.

To procure from the earth its produce, animal and vegetable, in the greatest abundance, involves the labour of the human family; this labour has a threefold value—viz., pecuniary, physical, and intrinsic; and each of these has its own peculiar claim, not only upon the attention of the agriculturist, but also upon that of the public generally. Hitherto there has been a general proneness to look upon farmers as a body isolated from what have been termed the manufacturing and commercial classes, or from those who live in towns; but the distinction is in the highest degree fallacious and objectionable; for when we begin to examine the employments of the latter, we find their labour is being applied, directly or indirectly, to procure from some quarter of the globe or other its produce, and to utilise the same, for the support of our race. In this manner the animal, vegetable, and mineral productions of every climate of the universe are brought into competition with those of the British soil: consequently, the labour of the home farmer is thereby also brought into competition with that of foreign farmers. Examined in all its length and breadth, our subject is, therefore, a very comprehensive one—more so than, perhaps, may be imagined by some at first sight; but the moment its details are practically entered upon, the industrial competition exemplified by the whole furnishes an instructive lesson as to the progress of science in the world, and the peculiar position which the British farmer occupies at the present time in the general race of industry.

The pecuniary view of the question is not the least interesting one of the three, as it represents, or ought to represent, the respective values of the other two—the physical and intrinsic, or the amount of muscular power applied by man, and the effect produced by that power. Thus, to illustrate the three divisions of our subject practically, if it costs £2 an acre to dig land a certain depth with the spade, 16s. to plough it with horses, and 10s. with steam, all to the same depth, then, in the first of these examples, there is, physically considered, the labour spent in the manufacture of the spade, as well as in that of working it in delving the land; in the second example, under the same head, there is the rearing of the teams, the manufacture of the team-harness and the plough, and the working of the plough in ploughing the acre of land; and in the third example, there is the manufacture of the steam plough, engine, and tackle, and the working of them in the field. Under the third division we have to consider the intrinsic value of the three methods of cultivation, or the comparative merits of delving, with horse and steam-ploughing.

Such is a general view of the three systems of cultivation, in each of the three divisions. The teams and steam-engine being employed at other work, their prime cost has to be distributed amongst the general operations performed by them; and the same conclusion applies to the spade, it being employed at other jobs besides digging; but the prime cost of the different kinds of implements employed in the cultivation of the land indicate a marked distinction in the economy of labour, and in the industrial organization of society, under a

practical comparison of the three examples of tillage. A similar conclusion would be arrived at relative to the other implements of husbandry in operation under each system. Thus, in the case of the small holdings of the sister country, the tenant's inventory of the implements of husbandry may enumerate only a spade, shovel, sickle, and flail, with the addition of a fork and wheelbarrow in the more advanced examples. Steam being only yet entering the field in a few exceptional cases, the inventories of the other two examples (horse culture and steam culture) cannot fairly be stated, more especially in reference to the future; but the spon in contrast with the sowing machine or "drill," the sickle with the reaping machine, and the flail with the thrashing machine, may fairly be taken as the practical data of comparison that indicate the investment of capital, economy of labour, and the industrial organization of society, as represented by the £2, 16s., and 10s. per acre.

It is more than ordinarily interesting and instructive to perceive how *the poor man's system of husbandry* (as it may not inaptly be called) is represented by the largest sum of hard cash directly out of pocket, viz., £2 per acre, and that the system which involves the highest degree of skill and the largest investment of capital in implements of husbandry is represented by the contrary, the smallest sum, viz., 10s. per acre; yet such are the incontrovertible facts of the two cases, facts which speak volumes in favour of the latter, and as much, if not more, in condemnation of any general attempt to perpetuate the former. But let us go into the details of the three systems piecemeal—practically, as it were, so as to arrive at useful conclusions.

In the first place, then, let us put the question directly in the form of an interrogatory: "Can any poor man afford in modern times to pay £2 per acre for delving his land?" say, for the sake of argument, a small holding of a few acres of land, as in the sister-country Ireland, this being at the present time a favourite theory with too many Irish economists, for the permanent reformation of Ireland. We have taken the estimate of £2 per acre somewhat unwisely, for at 2s. 6d. per day it would cost us near twice the money, so that generally and practically speaking, no small tenant who can make a shilling per day regularly off his small holding can afford to delve it with the spade; and this is just what experience has long taught, and still teaches, not only in Ireland, but in every province of the kingdom, for when the small tenants get regular employment from the large farmers, or any other source, let the wages be only a sixpence per day instead of a shilling, and they hire a team to plough their land, silt in Ireland as in England and Scotland, and all the world over.

The extra tear-and-wear upon nerve and muscle affords a practical solution of the small holder's problem as to why he employs a team to plough his land, when he can either by "hook or crook" "raise the wind" to pay for doing it? And this applies with something more than double force when the land is dug with the long-handled tools generally used in Ireland, for an Irish labourer digging with his long-handled spade, or earthing up his potatoes in a "lasy bed," with his

shovel, is a mechanical anomaly, wholly inconsistent with the present age; and so indescribable as to the *modus operandi* of the functional details of the mechanism exemplified, that he requires to be seen at work on his own holding, to be thoroughly and practically understood. Figuratively speaking, you may call it up-hill work, or what you please, for the Irish workman; but in plain-English there it is, a system that speaks for itself, in language that cannot be gainsayed in the estimation of anyone in the most superficial manner acquainted with mechanical science, for every spit or pound of earth lifted costs the poor unfortunate labourer an expenditure of muscular power double, triple, and quadruple that expended in doing an equal amount of work with a short-handled spade, or digging-fork, such as is used in the United Kingdom. And this does not show the worst view of the poor man's position, for to obviate the waste of the muscular power of the arms in using his long-handled spade or shovel as "a losing lever of the third kind," and to prevent complete exhaustion of strength, he works it as much as possible over his knee as "a lever of the first kind;" but in doing so the other muscles of the body are called upon to perform extra duty, the fulcrum pressure upon the knee being double, so that the general tear-and-wear of nerve and muscle and exhaustion of the system may be more easily conceived than estimated, for although the knee acts as a fulcrum to the long handle of the spade, yet the ground under the foot of that leg is nevertheless the common fulcrum to the whole mechanical system in operation; consequently in putting the spade into the ground the weight of the body has to be raised at every fresh spit; while in lifting that spit and turning it over into its place, the whole body from the ankle upwards is again lowered and rocked backwards over the ground under the foot as the general fulcrum. In working his shovel the mechanical details are somewhat different from those above in working the spade, and many degrees more anomalous, for it (the shovel) is driven into the ground by a central jerk of the body over the foot, or rather ground under it as the fulcrum. Hence the extravagant oscillations of the body in accordance with the well known mechanical law that "power is only gained at the expense of space." At a distance one would think the Irish labourer was doing a vast amount of work; but when you come up to him the practical question resolves itself into the very reverse, viz., *How to do the least amount of work at the greatest sacrifice of the tear and wear of his body!*

In the examples of the horse and steam plough, the latter involves the smallest expenditure of muscular power of man, directly applied in the ploughing of an acre of land. And as compared with the English spade and digging fork, the method of turning over the furrow-slice requires a much less expenditure of force than in lifting and turning the spits in digging. In this respect the plough has a decided mechanical advantage over the spade; an advantage which is duly appreciated by the experience of every practical man, whether he is versed in mechanical science or not; and which satisfactorily accounts for the preference given to the former by small tenants, when they can raise the wind so as to start the teams in their fields under all the disadvantages of frequent turnings, trappings, and broken yokings, to which the cultivation of small holdings is subject.

As to the intrinsic value of the work of tillage done, the quantity and quality of the produce is the practical index generally adopted by farmers. The rule, no doubt, involves manorial considerations, as well as those purely of tillage; besides others of a kindred character, as the quality of the seed sown, and the professional skill with which the various operations of husbandry have been executed; but into details of this kind we need not enter, as they can better be left in the hands of the reader, so as to apply them each to his own individual case practically.

Under this head spade husbandry has had a powerful advocacy in the columns of the agricultural press, generally speaking; but however promising may have been the harvest returns of individual experiments, it has never been able to establish itself as a general practice even in those provinces of Ireland mostly under small farms, with an over-redundant supply of labour; and with the progress of steam it is evidently losing ground, becoming annually less and less popular. Under this head, therefore, the general conclusion may at once be deduced from the facts of the case in favour of the steam plough.

Under each of these heads it will be seen that, although a certain degree of rivalry exists between different systems of industry, a harmony of purpose, nevertheless, prevails throughout the whole in favour of progress; that this harmony is based upon the most economical application of skill, capital, and labour; and that for the future the cause must continue to advance, not only in this country, but throughout the world generally. We might quote many instances in proof of this conclusion, there being at the present time a rapidly increasing demand from every quarter of the globe for the most improved implements and machinery that can be had for the cultivation of land and the husbandry of its produce, but one will suffice, viz., Egypt. The valley of the Nile has from the earliest ages of the world been famed for its agricultural capabilities, and although under a long period of misrule it has fallen far behind Western Europe, yet no sooner has the Viceroy of Egypt put improved implements in the hands of his Coptic fellahs, the most down-trodden labourers of our race, than they begin to show signs of former greatness, and to advance morally and physically in the race of improvement; and almost the same conclusion applies to our East Indian empire, and much of the old Oriental world generally. No doubt the progress yet made is small, but the work of improvement is fairly begun, and promises at no distant date to extend its influence to this country by a less or more reduction of the money value of most kinds of agricultural produce, and also in a similar manner bearing upon the price of labour. In America, from whence we have long received a large supply of corn, cotton, &c., wages are high. But in Egypt and the East the money price of agricultural labour is, on the contrary, low; but their implements of husbandry are rude in the extreme; so that the amount of work done and its intrinsic value have hitherto restored the balance to a state of equilibrium, and something over in favour of the British farmer; but the adoption of our most improved implements and their skilful employment cannot fall of eventually turning the scales against us, both as to the price of labour and the market value of its produce.

There is one practical consolation left the British farmer—viz., keep a respectable distance a-head; while something may also be said about advancing the wages of foreign labourers, and the other conditions at issue that would place him (the farmer) on a level with his foreign rivals. For a time, however, the low wages and subservient condition of the labourers of the Continents of Europe, Asia, and Africa, will be taken the advantage of, in a manner that will enable the mercantile interest to keep down prices in our markets; but with the progress of international communication this degraded state of the industrial balance will grow less and less, and finally cease to exist, or, at least, to be injuriously felt by our farmers and labourers, more especially as regards Asia and Africa—there being in those two divisions of the globe nearly as wide a field for the territorial extension of agricultural labour as in America; and hence a corresponding demand for, and price of labour.

The summary of the whole matter is more skilful labour applied to the land, at less money per acre, but at higher wages to the labourer all the world over. From this it follows that fewer hands must be employed in the performance of a given quantity of farm-work; that farmers must continue to go on investing more and more capital in chemical and mechanical appliances; and that in order to remunerate them for these increasing outlays of skill and capital, an increase of produce must also be obtained from the land. At the present time these are significant conclusions, pregnant with practical instruction—to those who lag behind coequally with those who lead the van in the march of agricultural improvement. They also afford no little useful information to our manufacturing and commercial classes, especially those more directly connected with the agricultural interest, such as are principally engaged in the manufacture and commerce of home produce. The subject is even, if possible, more deeply interesting in a business sense to our town-trade communities than it is to those exclusively engaged in farming, for improved agriculture as above is but an indirect way of enervating the proposition of improved trade. Apart altogether from Ireland, the United Kingdom furnishes in every province a tangible demonstration of the soundness of this conclusion. E.

THE CULTURE OF FLAX.

If the cotton industry is waning, flax and wool are certainly looking up. The last colonial wool sales showed an increasing demand and improving prices, whilst the coming sales will, in all probability, maintain present prices, and show an upward tendency for the coarse and long grades suited for warps and fancy dresses. Large as the existing supplies of wool are, there is a steady demand for more, and increasing supplies are not likely to interfere much with existing prices. Large as the colonial wool trade is, flax might soon equal, or even surpass it; and there is scarcely a present limit to the demand, either here or in America and other countries, for the fibre and the prepared textile fabric. The demand for flax (observes a writer in the last number of the quarterly *Journal of Agriculture*) is, to a certain extent, limited, simply because the supply is limited. That our manufacturers could take, and would take, a much larger supply of the raw material than they have at their command at present, is a known fact. The supply derived from home sources, as well as from northern continental Europe, is quite insufficient to meet their requirements, and additional supplies are now sought to be obtained by encouraging the growth of flax in India. As an evidence of the insufficiency of the home growth to meet the demand, we have only to look at the state of the linen manufacture in Ulster. The consumption of flax there exceeds 100,000 tons a-year, while the average production of flax in all Ireland does not exceed 80,000 tons.

Although linen goods are now obtainable at a less cost than they were at one time, the value of flax has not been lowered, any decrease in the value of manufactured goods having been effected by improvements in the various stages of the manufacture. This fact, therefore, shows that no fears need be entertained of over-stocking the market, should the home and foreign production of flax be considerably increased. The want of this fibre seems to be almost as much felt in America as in England; hence California, notwithstanding its gold and its large growth of grain, is now turning its attention to flax. In California the farmers are not only following the growth of flax, but also that of hemp, and speak of their prospects of large profits from each. The hemp now in use there, imported from Manilla, costs them about £21 per ton, and they calculate upon growing it to a profit at much less.

Statistics are not pleasant reading, but they serve to illustrate the importance of this textile industry in the United Kingdom. Although there are not many more flax mills existing now than there were in 1850, yet the number of spindles has largely increased, and the number of power-looms trebled, and there are fully one-third to a-half more persons employed in these factories. The hands, male and female, employed are nearly 100,000; and Scotland now employs as many people as Ireland in the linen manufacture, and has, indeed, a larger number of factories.

The quantity of flax imported into the United Kingdom in 1820 was 532,882 cwt., in 1836 it was over 1½ million cwt., and on the average of the last three years it was no more, great as is the demand for linen. The price of dressed flax ranges, according to its quality, from £33 to £100 per ton. Looking, then, at only the lowest price, is such an offer to be despised? What other crop promises the same reward? But why speculate upon the unfortunate extreme—the lowest price—when the Australian colonists have the same means as the French and Flemish, if not superior, of producing the best qualities of this article?

They have, without doubt, a far superior soil, and in many respects even a better climate than those countries. Flax is erroneously said to be an extremely exhausting crop. But grant it is so. The soil of Australia is inexhaustible. The constant cropping of even twenty years in many places, and that without an atom of manure, has failed to diminish its virtues. Every time the rich alluvial land is stirred, its humus seems to be as fresh and abundant as if the soil had received all the benefits of fallowing, manuring, &c. No crop requires a more careful attention than flax, both before and after the seed is in the ground; and if a farmer expects to derive profit from his land and recompense for his labour, the best thing he can do is, to pay his land the compliment of justice—that is, if he cultivate at all, he may as well cultivate on sound practical principles. The soil turns a deaf ear to reason; nothing but experience and experiment will make the earth smile. Slovenly farming will never realize £100 per ton on any four acres of the richest land on the globe.

The culture of flax in the United Kingdom is unprofitable, for reasons which do not apply to Australia. It is generally considered here to be an extremely exhausting crop, which cannot be safely allowed to ripen its seed on the same land oftener than twice in nine years in regular rotation. It was formerly believed, indeed, that if it were grown on the same land more than twice in fifteen years it would completely exhaust the soil. These opinions are now considerably moderated; they prevailed when the principles of agriculture were less understood. It is now acknowledged that flax is not more pauperising than any of the green crops, when it is pulled for the sake of the fibre before the seed is ripe. Nor is it, under any circumstances, more severe upon the land than white crops in general. It may therefore be grown again on the same land with complete success, in alternate rotation with potatoes, turnips, cabbages, or even after peas and beans, for any number of years, only you must recollect the land requires to be well manured for each crop. This is an important improvement on the celebrated Flemish farming, where the period of flax, in their rotation, is twice in nine years. Hence it is the great expense of manuring which makes the culture of flax unprofitable in England.

"Supposing," says a Tasmanian journal, "one-third of the land under culture with grain in Tasmania, or say 80,000 acres to be put under flax at our next seed time, we should first have 6,000 tons of marketable flax for exportation in 1865, and then 350,000 bushels of linseed, over and above what would be required for next year's crop, or what might be crushed for oil and cake to fatten stock. The value of the flax could not, it is said, be well laid under £240,000, and the seed at 8s. per bushel would amount to £100,000. Thus, by a combined effort, flax might be placed at the head of our list of exports in one year. Wool is at present our largest. That amounted in 1862 to £336,350. But, according to the estimate given above, flax would exceed it—exclusive of what would be left for home consumption. Supposing this to be anything near the mark, and supposing we sunk our export of grain and flour for 1865, we should still net some £160,000 on our year's exports, and should be exchanging one crop, for which the demand is limited at remunerative prices in these colonies, for another which would pay for shipment to all parts of the world, and in which there is no chance in any conceivable period of time of the supply outrunning the demand."

We know that a fine sample of flax, the growth of Tasmania, was sent to the International Exhibition in 1862, and carried off a prize medal, of which the holder is very proud to this day. We know, also, that much of the crop from which this sample was taken was manufactured into twine and plough-lines in Hobart Town, and that there are not a few Tasmanians who can boast of having driven their horses at plough, in beautiful flax lines, made in colonial rope-walks, out of fibre produced from seed grown by their own hands. And the number of persons who can make this their boast would be very largely increased if the matter was only taken up earnestly by the agricultural societies of the colonies, and a prize for the growth of flax appeared on every one of their annual lists.

The Australian colonies cannot always go on with the growth of wheat, oats, and barley, or with the breeding and rearing of stock. They must have some change, and the more multiform the variety of their agricultural productions the better. Nor do we see any that could be more profitably added to those they already possess than flax. The advantages to be derived from the culture of flax there would be enormous. There is, for instance, no finer country in the world for its growth than Tasmania. It resembles in a striking degree those parts of Ireland in which flax is most successfully cultivated. But we ought not to lose sight of the demand there is for this article in England, and how greatly the demand at remunerative rates exceeds the supply; neither that nor any of the neighbouring colonies will ever be able to send home wheat with the certainty of a profit. South Australia has satisfactorily disposed of that point. But if they were all to grow flax in quantities proportioned to those in which we now grow wool, we should not only be sure of a market in England, but at such prices as would pay. In whatever region the plant is sown, it is invariably ready for pulling three lunar months, more or less, after it is committed to the earth, according to the temperature of the climate from which the seed has been brought. If it is cultivated for the sake of the fibre, it must be pulled a little earlier; if for the seed, it must be allowed to ripen perfectly, which will require some days longer. But it

may be laid down as a general rule that flax is fully ripe in three months from the time of sowing.

This fact being established, then, it is the business of the experienced colonist to choose the most congenial three months of the twelve for the growth of this plant, namely, those three months in which the growing crop shall be perfectly secure from the destructive influence of hot winds, and in which, at the same time, there is the fairest chance of sufficient moisture; and in this manner the question might be considered as settled. For the observant husbandman will be able at once to decide upon the fittest time for putting in his seed, knowing what to avoid and what to desire. The usual seedtime in the warmer latitudes of Europe, is before winter, in order to avoid the immoderate heats of the summer and autumnal months, which would inevitably destroy this crop.

Jute has become an important item in our textile manufactures, and does duty now, largely, for mixing with many more valuable materials. The factory returns are not brought down to the present time, to be available yet for reference; but when it is borne in mind that in 1861 there were 86 factories devoted to this fibre, with 88,000 spindles and 554 powerlooms, employing 6,000 persons, when the imports were only 822,000 cwts. of jute, whilst last year the imports reached over 1,000,000 cwts., and this year it is expected will be double that quantity, the increased factory employment given may be estimated. The waste-ends of this fibre are now being made available for paper-making; and the jute "gunny-bags," as they are termed, largely imported as sack and bale-wrappers for India produce, especially from Calcutta, are also generally collected as a paper material. About 70,000 or 80,000 pieces of these, exclusive of the quantity derived from the baling, are annually received, and an enormous trade has been developed in this fibrous material, which, however, is of a very rotten and perishable character. Notwithstanding the impetus thus given to Indian commerce, we should infinitely prefer to see the growth of the more important and serviceable fibre flax extended in the United Kingdom and our colonies.

THE USE OF MACHINERY IN MAKING CHEESE, AS PRACTISED IN LEICESTERSHIRE.

Dairy farms occur in all parts of the county, excepting that portion consisting of first-rate feeding land with little or no arable attached. On light and loamy soils, where a considerable part of the farm is ploughed, the dairy forms an important feature in the occupation, and much butter and cheese is made.

We have lately been favoured by a lady, who has studied the art of dairy practice with great assiduity and perseverance, to witness her system of management. In her early experiments she met with some disappointment, but has now overcome all difficulties, and produces butter and cheese of most excellent quality—the cheese having taken prizes at agricultural shows, and obtains the best price at our fairs. She superintends her father's dairy of thirty cows with great success. He is now in the "sere and yellow leaf," but hale and hearty; and a more respectable gentleman, or one who ranks higher as a practical farmer, cannot be found in the county. He is an old volunteer, having been in the Yeomanry Cavalry sixty years, and is now the oldest member of the regiment. A testimonial has lately been presented to him for his long and efficient services. He is also the oldest fox-hunter,

having joined in the chase with the Quorn Hounds in the days of "Old Meynell," and has followed them over the fields of Leicestershire nearly every season since. He is now occasionally seen at the "meets," receiving the kind congratulations of numerous old friends, and heartily joins in the chase: and long may he be spared before his valuable life is brought to a close.

The lady before mentioned, not at first succeeding to her satisfaction, determined to try a new plan, and introduced machinery in the dairy as far as practicable. For this purpose she purchased one of Kevil's patent cheese-making apparatus, made by Griffiths and Browetts, 68, Bradford-street, Birmingham. We can only very imperfectly describe this machine, or the process of cheese-making by it: but the following will be the best explanation we can offer. The cheese-pan is made of tin, and placed upon a boarded platform in the dairy, raised about a foot above the floor, and as much beyond the circle of the pan, on which the dairy-maid stands when working at the machine. The sizes vary to make from the milk of ten to fifty cows, or, if used twice a-day, will serve for double those numbers. We give the dimensions

of one for twenty cows: 8 feet 2 inches diameter, 1 foot 10 inches deep, will hold fifty gallons, and the price \$25.

The practice in this dairy is as follows: The cheese is put together at a temperature of 80 degrees. The whole of the cream is taken off the night's milk and is used with the new on the following morning (this is in consequence of the cows being kept on rich grass land); rennet of an equal quantity and strength is used, care being taken not to use more than will curd the milk sufficiently; the time occupied in doing so should be from one hour to an hour and a-half. The temperature of the atmosphere has great effect in this process: in warm weather the milk changes to curd quicker, but it ought not to occupy less than one hour. The curd being now ready for breaking, it is cut by a blunt long-bladed knife in all directions, that the knives fixed in the machine may more readily pass through it, without pushing the curd round the pan in a body, which the force of the knives would otherwise cause it to do, and the breaking process would not be perfectly effected. At this stage the operation of the machine commences, and we must first describe the apparatus which is added to the pan to perform the work. An iron bar is fixed to the pan, and forms an arch over it, in the centre of which is a socket through which an upright shaft is passed, and to it is attached two square wings, extending through the whole area of the pan, and in these are fixed a series of knives, on one wing placed horizontally and on the other vertically. At the top of the shaft, above the bar, are two handles, by which the wings are made to revolve, and they are worked till the curd is thoroughly broken. The bar and the whole of this apparatus is then removed, and a large cloth is thrown over the whey and curd, and the whey sinker placed upon it. This is in the shape of a wheel with about eight spokes extending from the centre to the rim, which fits inside of the pan. This gently presses down the curd, and the whey remains above separated from it; this will be effected in about twenty minutes, when the whey must be run off with all despatch.

We must now return to the machine, and state how this is effected: and this is one of its greatest improvements upon the old plan of lading out the whey by the hand. An opening about two inches wide is left at the side of the pan, extending from nearly the top to the whole depth. This is covered on the outside by a half-tube or pipe, the flat side placed towards the orifice; and facing this, on the inside, is fixed a gauze wire filter, which prevents any curd passing through with the whey. At the bottom of this channel is a tap, which is turned to let off the whey, which escapes through the filter, into the pipe, and by the tap into a vessel placed to receive it. The whey sinker is then taken out, the cloth removed, and the curd cut into square pieces, turned over, and placed as much as possible in the centre of the pan, heaped up in the middle. It is then covered with the cloth again, well tucked in round the sides; the *pressing-plate* is then placed over it. This is a strong tin plate perforated with holes, and fits within the pan. The iron bar is again placed over the pan, and in the centre socket is affixed a screw which acts upon four arms or bearers, their ends resting upon the pressing-plate, by which an equal gentle pressure is given to it, and by turning the handles is increased while any whey will drain from it. The whole of the apparatus is then removed, and the pressing-plate taken out. The curd is again cut into small pieces, and placed on one side of the pan to insert the *false bottom*,* which is similar to the pressing-plate, only cut into four quadrants, for the convenience of fixing it

in the pan without removing the curd. When two of these are placed, the cloth is laid over them, and the curd is lifted upon them; then the other two parts are put in, and the curd wrapped in the cloth placed in the centre: there is a space of about four inches between the false bottom and the bottom of the pan. The pressing-plate, the bearing arms, and the iron bar are placed as before, and *gentle* pressure used at first and increased at pleasure. This process is repeated—say two or three times—till the whey is all extracted and the curd is sufficiently dry to pass through the mill. This machine has a hopper about one foot square, with two spiked rollers working within each other, and one fixed beneath, and is easily turned. When curd is being ground a little salt is thrown in (half-a-pound is sufficient for a cheese of 50 lbs.); the curd is passed through the mill a second time, for the purpose of thoroughly mixing the salt with it, when it is ready for vatting. The vats are perforated with holes round the rim and at the bottom, and of various sizes. The curd is lifted into the vat by a tin scoop with a strainer under it, and very little pressure is necessary, no whey being forced out by this operation, the curd being very dry. An open zinc hoop, called "a sinker," is placed within the vat to hold the curd when filled above the edge. The ends of the strainer are then turned over the top, a board is placed over the whole, and the cheese is ready for the press. After it has been in the press two hours, it is turned into a dry cloth, and plugged thickly all over the cheese on both sides with a wooden plug about half-an-inch diameter. It is again put into the press, and turned morning and evening into a dry cloth, and kept under pressure till the cheese-cloth is perfectly dry, which is considered a sure indication that the whey is all out of the cheese. From three to four days is the time usually occupied in the press, during which time iron skewers are inserted all round it through the holes in the vat, in an inclined position, for vents to allow the whey to escape. These should always be drawn out an hour or more before the cheese is turned, to allow the whey time to drain off. When the cheese comes out of the press the edges are ironed with a common smoothing iron, to take out the marks the hoop will have made during the time of pressing. A very strong brine being prepared of salt and cold-water, the cheese is placed in it for two days, for the purpose of hardening the outside. It is turned over every day, always having a slight covering of salt spread on the side that is uppermost. When the cheese is taken out of the brine it is well washed with boiling-water, bandaged with a stout linen webbing (made on purpose for cheese-binding), carried into the cheese-room, and turned every day for some months, till it is fit for market. They are laid on boards for three weeks or a month, and then on a plaster floor. The cheese-room is kept dark, and no windows allowed to be kept open, or otherwise currents of air blowing upon the cheese. It is preferred to keep the room as close as possible, for the purpose of ripening the cheese, and at an equal temperature as possible—never more than 60 or less than 50 degrees.

As the quantity and quality of rennet used is an important element in making good cheese, we state the manner in which it is made in this dairy. A quantity of maw skins, in the undried state, are placed in a large stone jar, which holds about eight gallons, and filled with brine that has been used for hardening the cheese during summer. The skins should be well stirred up in the brine every two or three weeks during the winter months, and always an equal quantity of this liquor put to the milk. The advantages of this system over the old may be thus summed up: A larger amount of curd is obtained from a given quantity of milk, and a great saving of time and labour is effected. During the time the curd is setting, and the whey draining off, the dairy-

* This does not belong to the original machine, but is the invention of Mr. Pilgrim, of Burpage, in this county.

maid may employ herself with other work belonging to her occupation, and the whole will be completed in two-thirds the time required by the ordinary process. The breaking of the curd is effected by turning a small handle. The whole toil of lading off the whey with a bowl and passing it through a sieve, kneading, and pressing the curd by the hands when put into the vat, is

entirely saved, and the whole process is rendered more economical, simple, and cleanly, and a greater uniformity of quality is secured. There is scarcely any whey-butter made by this system; and it is certainly a bad practice, when the butter is in the curd, that it should be forced out with the whey, and the cheese robbed of its richness.

REARSBY.

OCCASIONAL OPTICAL PHENOMENA OF THE ATMOSPHERE.

Although the optical phenomena of meteorology are liable to be regarded as matters of secondary consideration, in a practical point of view, it is very desirable that the agricultural student of meteorology should be informed as to the conditions necessary for their production; for in this knowledge lies any good to be derived from their observation. The appearance of any striking phenomenon in the heavens is, moreover, a subject of such general interest, that to be ignorant of the causes that produce it, is to feel oneself further down in the scale of humanity than is pleasant, in these days of popular science and popular literature. It will therefore not be out of place to say a few words on this class of phenomena exclusively, especially as some of them afford useful hints as to the state of moisture or dryness of the air.

In treating of this subject, we shall in the present paper confine our attention, as the heading of our article implies, to those phenomena which are seen every now and then, but whose appearance cannot be defined as occurring at any particular time or season; in short, to phenomena of a non-periodic character. To a future time we must leave the discussion of those which are chiefly visible at stated periods.

Before proceeding to the explanation of individual appearances, we must consider for a moment certain characteristics of light; for without some acquaintance with the nature of light it is not easy to comprehend the modifications that luminous rays undergo in their passage through a medium of variable density like our atmosphere.

We have seen, in former notes, how the sun is the great source of heat, and have considered the phenomena that he gives rise to in that capacity. We now have to consider this body in another capacity—namely, that of the light-giver. We shall not, as a matter of course, go deeply into the theory of light, especially as it is a subject on which there exists so much difference of opinion even at the present day; but shall content ourselves with giving just so much as will suffice for our purpose, and no more.

Luminous impressions, then, appear to be due to some very subtle fluid pervading all Nature, and possibly extending beyond our globe into infinite space: to this fluid has been given the name of *ether*. Luminous objects possess the power of putting this ether in motion—analogueous to the power in the strings of musical instruments to set the air in motion—and this motion is capable of appreciation by the eye. In passing from vacuum into the air, or from a denser into a lighter medium, the undulations of this ether are liable to certain modifications; and it is to some of these that we now purpose to call the attention of our readers.

From the supposed nature of this ether it is not possible to make direct experiment on it with a view to determine its exact properties; it is, however, concluded from analogy, that the ether existing in any body is denser than that *in vacuo*, and that it is different in the different natural bodies. We compared the undulations of light to those of sound, from the similarity of their propagation;

but the analogy does not end here. Sound, as we all know from experience, when it meets with an obstacle, like a wall, divides—a portion of the sonorous wave being propagated through the wall, beyond which we hear it; whilst the other is reflected, and produces the well-known phenomenon of echo. The behaviour, under similar circumstances, of light, is very analogous: if luminous undulations fall against a body, part of them pass into and through the body, and the other part is reflected.

But there is another feature in the nature of light that we must not omit to mention, and that is its colours. Ordinary white light is composed of a number of coloured rays, as proved by the celebrated discovery of Newton, which rays differ considerably as to their degree of refrangibility. The colour, therefore, of terrestrial objects is due to their decomposing the white light, and reflecting certain rays and absorbing others.

When light is allowed to pass through a translucent body, such as glass or water, it emerges with but slight loss; accurate experiment, however, proves that some of the rays are absorbed by the body, and that the amount of loss depends on the nature and thickness of the body, as does also the particular rays mostly acted upon. From this fact, together with what we said with regard to colour, the reader will have no difficulty in accounting for the varied phenomena of colour.

After these few remarks upon the nature of light generally, let us proceed to observe what befalls the rays of light in their passage through the air under ordinary, and what under peculiar, circumstances of the atmosphere.

The atmosphere, when free from fog and cloud, is one of the most transparent bodies we know; for objects can be clearly seen at a very great distance, and that too without suffering much in distinctness. But although the air is so transparent, it is not perfectly so, and a small fraction of luminosity is absorbed in the passage of light through the atmosphere. Indeed, if it were not so, the vault of heaven, which when unclouded appears of so exquisite a hue, would be black; and the two great lights, the sun and moon, would appear as bright discs accurately defined. Nor is this all: in all places where the sun's rays did not directly penetrate, or where they were not reflected from terrestrial objects, there would be darkness; and when the sun sank below the western horizon impenetrable darkness would instantly succeed to light. Now as these phenomena do not happen, we must conclude that the atmosphere does absorb a portion of the light which passes through it, and also reflects a portion; hence the vault of heaven is illuminated by them, as is also terrestrial objects on which the sun does not shine directly, and causes the insensible melting of day into night. The transparency of the atmosphere is not constant, but changes like its other conditions; indeed, everybody has discovered this fact from his own experience: on some days we can see objects with extraordinary clearness, which at other times can hardly be distinguished at all.

From what we have said it will be clear to the intelligent reader, that the greater the thickness of the stratum

of air which the rays have to traverse, the greater will be the amount of light absorbed; a practical illustration of this is afforded by the sun. When the sun is in the zenith its rays have the least thickness of atmosphere to pass in coming to us; but the more it approaches to the horizon, the thicker becomes the stratum through which its rays must pass before reaching the earth, and, consequently, the light we receive becomes more and more feeble: experience shows this to be the case.

It is a painful matter to direct the gaze for an instant to the meridian sun, but when he is nearing the horizon we can gaze undazzled; for the same reason we are enabled to see very many more stars in the zenith than towards the horizon.

The air, or, as it is usually termed, the heavens, appear of a blue colour, this is not, as might be supposed, due to any peculiar hue in the aerial particles themselves, but is the result of atmospheric reflection and absorption. The air does not act equally on all the coloured rays of the spectrum, but allows more of the red rays to pass, and, on the contrary, reflects more of the blue; but the difference is not perceptible until the light has passed through large masses of air.

The most attractive, and at the same time the most beautiful, of all optical phenomena presented to us, is the rainbow, as it is called. When the sun's rays fall on drops of rain, we see in the region of the sky, remote from the sun, one or two arcs of a circle tinted with prismatic colours; this phenomenon constitutes a "rainbow." Sometimes the two arcs are seen very complete; they are also concentric, their common centre being where the shadow of the spectator's head is projected. The interior bow, the one most usually seen, is the more vivid in colour of the two, and is called the inner, or first bow; the other the outer or second rainbow. In the former, the violet tint is within, the red without; in the second bow the colours are arranged in inverse order: that is to say, the red is on the inner edge, the violet on the outer. The conditions necessary for the production of a rainbow are simply that the rays of the sun should strike drops of water. Thus the rainbow is not unfrequently seen on clouds, in the spray of a fountain, and other terrestrial objects.

To produce vividness of colour, however, it is necessary that the light should be strong; lunar rainbows are occasionally seen, but very seldom with prismatic colours—they are usually of a pale yellow or white. We shall not dilate on the optics of the phenomena, as in that case we should have to presuppose an amount of knowledge on the laws of that science not usually possessed by the amateur meteorologist.

The next most prominent optical phenomena are those known as coronæ and halos. Let us speak of halos first. To this part of our subject we must beg particular attention, as halos are pretty sure signs of coming bad weather; and mistakes are frequently made by con-

fusing halos with coronæ, a fatal error, as the latter have no significance whatever in indicating the weather. Halos proper are great circles surrounding the sun or moon, most usually the latter, the diameter of which comprehends about 44 degrees. Now as these appearances prove the existence of *cirrus*, a cloud which forms when the barometer is falling, rain is generally not very far off. Coronæ, on the other hand, are circles of only a few degrees diameter, appearing to surround the sun or moon. They are sometimes of a red tint, and at others consist of several concentric rings, in which green preponderates. The formation of the coronæ is as follows: When light clouds pass before the planet, the rays of light fall on condensed vapour in the vesicular state, which produces on them certain modifications known by the term "diffraction." From the extreme brightness of the sun, it is not often that one can detect a solar coronæ, but around the moon it is frequently visible. If the clouds which occasion the formation of this appearance be not too thick to obstruct much of the light, the coronæ presents a very brilliant and beautiful appearance. In this case several concentric circles are seen, very distinctly coloured.

There are, besides the phenomena we have described, some others which come under this class, such as parhelia, tangent circles, and supernumerary rainbows; but as they are of very unusual appearance, and require, moreover, a practised observer to detect them, it is not necessary for us to describe them here.

Before leaving the subject, we must make mention of another optical effect, which, though so common, is perhaps not understood by a great many. If we walk out in the night, and look up into the vault of heaven, we shall perceive that the stars do not appear stationary, but seem to oscillate around the spot they occupy in space; in common language, they "twinkle." Not only do they appear to be constantly shifting their positions, but the intensity of their light is always diminishing and increasing, and sometimes their colours appear to change again and again. To this phenomenon philosophers have given the name of scintillation. The stars scintillate most vividly when near the horizon, and hardly at all in the zenith.

The reason of this phenomenon is in the unequal refraction which the rays of light undergo in passing through the differently heated strata of air in their passage from the stars to us; and as rays coming to us from near the horizon have a greater thickness of atmosphere to traverse, we can readily understand why the scintillation is greater there than in the zenith. The planets scintillate less than the stars; for as the latter appear as mere points in space, a slight displacement is apparent to the eye, whereas, the planets having an apparent diameter of some thirty or forty seconds, it is more difficult to detect their minute changes. From what we have said of the cause of scintillation, it is evident that under different states of the atmosphere its amount will be different. In gusty, uncertain nights, it is most strongly perceptible.

FARMING IN IRELAND.

The following is an extract from a lecture recently delivered before the Carlow Young Men's Christian Association, by Mr. Benjamin Haughton:—

Agriculture is the mainstay of Ireland. Farming—both north, south, east, and west—is the vocation by which the Irish people live; consequently, that upon which her nobility, her gentry, and her professional, mercantile, and official classes are supported. Take the city of Dublin, for instance, with

its 250,000 inhabitants. That city is almost exclusively maintained by the land. There are not one dozen importing merchants, and one dozen more of manufacturers in it. From that city, strange to say, the doctrine is now commonly promulgated—that Ireland is a country of too damp a climate to be a tillage country, and that the sooner it becomes a pastoral country the better. This is the teaching of the Lord-Lieutenant of Ireland, *ex cathedra*, at a cattle show banquet,

held at the Dublin Society House, in the year of grace 1862; followed up by Marquis Clanricarde; cautiously touched upon by the Duke of Devonshire at Lismore; and freely advocated by the theorists and political economists of the capital. Vain delusion! The population of Ireland is 5,500,000. To transform that fruitful land into a sheep-walk is to diminish its population to 3,000,000, and to reduce our people to this number is to reduce the great middle and upper classes in the same ratio. I ask you is not this a logical consequence—as true as that 2 and 3 are 4? What, then, is to become of you, lawyers and doctors, and even of you clergymen—both Protestant and Catholic? What is to become of you bankers and shopkeepers? What, I ask, is to become of you, gentlemen of the official class, who control our public institutions? What, in short, is to become of all you who cater for those 5,500,000? The immediate result will be a fierce competition for the reduced business, in which the capitalist and the man of intellectual capital will suffer equally with the rest; and the final result, which it will probably take five or ten years to effect, will be that one-half your numbers may cry, "Othello's occupation's gone." If you are men of spirit, you will, in such a state of affairs, rush from the land that gave you birth. If otherwise, you will become degraded to that social class immediately, or perhaps distinctly, below you. We must arrest this effort of fools and theorists to furnish the one-half of the population of Ireland. There is such a thing as fashion in the world—an implement of immense potency, wielded by a very small minority. It has now become the fashion to prattle this clap-trap broadcast through the country, and the cuckoo cry has been taken up in too many instances by the farmer; but I will maintain that it is the teaching of false prophets and of deluded and ignorant men, and I will back my argument by the precepts of the immortal Berkeley. I have just now said that this baneful cry is the cry of the political economist, based upon an ignorant and inhuman teaching. I have every respect for political economy as a science; but defend me and my country from the rule and government of the political economist. It is political economy by which shops, banks, and factories, railways, &c., are managed; no feelings of vulgar humanity are there allowed to hold sway; but woe betide the statesman or the magistrate who hopes to direct the destinies of a people by the ruthless laws of supply and demand, and of profit and loss. I accept as a truism the *idée Napoléonienne*, "That if the earth were made of granite, the political economist would grind it to powder." But how are we to prevent these gentlemen from pulverising us? How are we to arrest this depletion of our people, and this Tartarising of our fields and hills? How can we, the people of little Carlow, hope to avert the impending danger? Well, to begin, we are in the focus of the garden of Ireland, and in the centre of the most English and the most wealthy province of Ireland—Leinster. This is a certain prestige to begin with. We have a resident gentry, remarkable for their common sense and intelligence, and who are easy of access; we must look to them to assist us in our efforts. It is the educated, and intellectual, and intelligent professional and business classes who will suffer most in the political economist's *melée*; self-interest will actuate them; and let them bring that cultivated intellect which they possess to aid in the task by the suggestion of wise measures to our legislators, and each by his personal influence using his best efforts to change the current that has set in. The clergyman can do much by his advice. The lawyer is a man of great in-

fluence; he can actuate his client. The shopkeeper can daily take an opportunity of discussing the matter with his customer. What is the legislator to do? I cannot answer that question; but I feel confident that our 105 M.P.'s, if they put their heads together, can devise measures of that salutary class which are so much wanted. I can tell you what England did in the way of a remedial measure—one that was to make the country more desirable for the poor man. When passing the income-tax bill, she excluded from its operation all those classes whose incomes come under £100 a year. She was wise; had she not done so, she would have put a spoke in the wheel of emigration. I must confess, however, that I believe more may be done in the country house, the shop, and the field for this great question than in the parliament house. This being granted, then, what are the arguments in favour of tillage *versus* pastoral farming? 1. It is a most unwise thing for the farmers to devote their energies to only one system of farming. Suppose a cattle disease of malignant type to attack your herds—a plague, for instance, and we all know how very infectious cattle diseases are—what is to become of you? The whole country is pauperised at one blow. No; the mixed system is the proper one (Letter from a Lothian farmer in the *Times*, who says it is the only one at present adopted in the Lothians, and the Lothian farmers have instructed the world in the art of farming). 2. In the event of a foreign war, that country would be badly off which grew nothing but beef and mutton. Cereals should form a considerable part in our system. 3. Tillage farming gives more employment. The great inducements for grazing farming are, no doubt, the high price of beef, mutton, and butter, caused by the great prosperity of England, and the consequent ability of her artisans to consume a meat diet largely. But it had its drawbacks, and it would be well that these be carefully considered in time. There is a very common objection made by our farmers to the growth of cereals—in what they call the great change of our climate, and its excessive moist and humid character. We have a moist climate, being insular, and lying right in the track of the south-west sea breeze. We must ever have such; but my reply to this assertion is that it is all moonshine. I am intimately acquainted with the farmers of this district, and I find that what are called good farmers always have good wheat, no matter how the season goes. Farming is a business just like cotton spinning or milling, in which the application of capital to the soil is necessary—in which the purchase of improved implements are equally important in the matter of drainage. My reply to the assertion that the country is too humid for cereals is, that Scotland grows them extensively. We all know what Scotch seed is, and there are practical farmers in our neighbourhood who introduce Scotch seed every season. It is of splendid quality; and I myself have seen cargoes upon cargoes of Scotch wheat from Inverness, delivered in Dublin, of superb quality; and yet Scotland is absolutely a more humid climate than Ireland. Witness this table of the "rainfall" of the two countries; and let me remark that you have all heard of the Scotch mist. The average fall, according to Symons' tables, in years 1861, '62, '63, was—

Ireland ...	49	...	45	...	47 inches.
Scotland ...	76	...	53	...	57 do.
England ...	29	...	32	...	29 do.

Our climate is moist; but this drawback must and can be successfully contended with—by drainage, by improved imple-

ments, and by watching. There is a great opening now for flax culture. "There is a tide in the affairs of men, which, taken at the flood, leads on to fortune." This tide seems to

flow now; it is to be hoped we shall travel with it. It is quite certain cotton won't be cheap for many a long day.—*Carlou Sentinel.*

IS FARMING A BUSINESS?

For my own part, I look upon it as something undertaken to make a living by; and, although Nature causes it to be slowly profitable, I can see nothing to withdraw it from the rules and customs that regulate other business transactions non-agricultural.

In ordinary undertakings, capital is attracted and flows more freely into channels where its course is free and unobstructed; and it is naturally diverted from those encumbered by obstructions. That rule, in my opinion, holds good equally for agriculture.

Filling the British stomach is, in my opinion, the most important of all trades and manufactures; and, in order that it should alike benefit all parties concerned, it ought to be especially conducted upon the most intelligent and recognized systems of commercial equity. But is it so managed? In my opinion, certainly not. There is no free trade in it, but it is almost smothered in the swaddling clothes of old feudal customs and practices. Can I wonder, then, that agriculture is poor, and comparatively unremunerative? I am constantly told by landlords that it is very difficult to obtain men of sufficient capital to give full development to the powers of the soil. I will leave out of the question for the present the game preserves and the power over men's political consciences, and take the mere question of tenure. In this respect, I can see no cause for difference between town and country.

If you let a house in a town to a trader or manufacturer on yearly tenure, depending, in fact, on the will of the landlord, you may rest well assured that that tenant will do nothing to alter or improve the landlord's property. But, suppose you grant him a lease: do you suppose that he would accept of that lease unless he had the power to transfer or dispose of it? I don't know of such an instance in all my town knowledge.

Take my own case; and I could multiply it by thousands. I hold both my places of business on lease, and have expended on them, in permanent and other improvements, over £20,000. Should I have done so without the power of sale or transfer? One of these leases is held under the Corporation of London, and they reserve to themselves the approval of the incoming tenant; but they were never known to object to a suitable tenant; and, consequently, their houses and lands are always sought after by men of capital, who invest freely. Moreover, although it is well known and calculated that, at the expiration of leases, the Corporation will take increased rentals, and participate (as they ought to do) in the general enhanced value of the property, caused by efflux of time and the tenant's own improvements, the tenant in possession almost invariably commands a preference, if willing to give the price, or near the price, equitably affixed by the Corporation surveyor.

No tenant is ejected on political or religious grounds, or from personal feeling, for the City of London is the cradle of civil, religious, and personal liberty; and yet there is no place in the world more loyal and orderly, nor where life

and property are more secure. The result is that capital flows amply into our good old city, which the late Baron Rothschild, in his examination before the Lords' committee, named the financial heart of the world.

But why should not a tenant have the right to sell or transfer his lease? The human mind is active and variable. An enterprising man may desire to exchange or improve his investment, as is so frequently done in the trading, commercial, and financial world. This activity and progress is the very soul of business; but agriculture is inactive and unenterprising, because it is tied down by a narrow and suicidal policy in fixed and slowly alterable trammels. To deprive the widow or orphan of the beneficial interest in a lease arising from a tenant's improvements, is a positive cruelty and injustice; and few men of capital will expose their families to such a risk.

Altogether, farming is so embarrassed and fettered by antiquated and semi-paternal customs, that it cannot rank in enterprise or progress with our general manufacturing, commercial, or other interests. The fear of loss of political influence is really a mistake, for that influence is exercised now by both parties; and so it would be then, for you cannot make men all think one way.

It requires no calculator to predict that the greater freedom of action in agriculture would do what it has done in towns—enhance the value of property greatly to the landlord's benefit. It has been stated on reliable authority, that the mere facility of ready transfer of land would add 10 per cent. to its value. I am quite sure that it would attract to it many improvements; just as we see new enterprising tenants in towns.

Under the circumstances I have mentioned, our good old City of London is being actually rebuilt; convenient, elegant, and substantial business palaces rear their heads on the site of old antiquated dilapidatories, and the land on which they stand has advanced in value from 100 to 500 per cent. A good deal of it about the Exchange is now worth £1,500,000 per acre, and a site about the size of a nobleman's drawing-room would, if near the Royal Exchange, command a ground rental of £1,000 per annum, equal to the rental of a thousand-acre farm.

I know of many estates that could be enormously increased in value, both to the owner and to the country at large by such means as I have indicated. The humility of poverty and subserviency would be exchanged for a respectful but wealthy and independent action, not at all inconsistent with the best and most kindly feelings as between man and man.

April, 1864.

J. J. MARCHI.

P.S. The following truthful letter addressed to me by a lady in Worcestershire makes a suggestion which is worthy of consideration. Certainly, if yearly tenure is to continue, capital will not flow as it should do, unless in some way secured:—

"Sir,—I have waited, but in vain, to see how the pre-

poor tenant right would be forwarded; it will, you know, come to nothing. How many tenant farmers dare press the question when only holding land from year to year? They must hold their tongues and be thankful; for how many are there watching with eager eyes for the time when old So-and-so shall drop off, or poor young Tryhard have spent his last sixpence in bringing his land round! Trade of every class and profession, indeed, can protect itself, and they do wisely do so. But what have we farmers done? Do we not toil on and on, sowing our money, and little knowing if we shall see it again? I could tell you a tale that would make all English blood boil, of my personal wrong; but being only personal, I can get no redress by law. I could have exposed false men, but have further robbed my children. A sweeping dire calamity one would, in England, get ready help from; but for personal loss few think about it, and yet how many hundred farmers in England are yearly turned adrift for a pique of the agent's, or a higher bidder, or a more eligible neighbour! and he, poor devil, singly, can get no help; he must go, and, let seasons be what they may, sell stock, &c. Ah! well you must know, to make farming pay there must be money sunk in venture that no six months could see out again. Could you not be a director or proposer of a scheme of insurance to protect farmers against this sudden ejection? A farm, though taken

yearly, is taken in good faith of holding for years; to insure all permanent improvements could not be more open to imposition than any other insurance effected; and surely now a man almost holds his farm as his life, it is a most light tenure. Of course a properly digested scheme would alone bring it to bear, but I do think it very feasible; even these holding leases would then avail themselves of it, because it is well known not to pay to run land out, and landlords could say nothing against it; you ask nothing from them, and you can see your way in your outlay. A man who has made great outlay often has to endure very much, because the agent knows he may say and do as he pleases, grieve here and pinch there, for he cannot afford to go; this would be checked then; indeed, I could point out so many benefits to be derived from this insurance that I really think, if brought to bear, John Bull would leave off grumbling. I often read with delight your spirited enterprise in bringing forward schemes of improvement; believe me, farms and farmers would improve rapidly, and maybe rents (but don't hint at that).

"Now, there is a good Alderman, do not have another dinner till you have thought this over; you may laugh if you like at it, but think at the same time; it might be done, and relieve hundreds of brow-beaten young farmers, and give competence to us poor wives. I am one of them."

THE CATTLE DISEASE QUESTION.

The conveyance of fat cattle to distant markets by sea has become to England a very important problem in a two-fold sense: *First*, because she requires the oxen, sheep, and pigs to supply her increasing population with animal food. *Second*, being a maritime country, and possessed of an immensely increasing shipping trade, it is her interest to have vessels adapted for the purpose of conveying from exporting countries fat stock to supply the demands of her own markets in accordance with the requirements of the age. To allow foreign countries to outstrip her in the march of progress would be an affront to her time-honoured flag.

The proposition is self-evident; the difficulty lies in its reduction to practice. That, however, is no valid reason why the present antiquated sea-going craft, and barbarous practice with which it is attended, should be continued any longer, but the contrary. But let us go right into the heart of the subject at once practically.

The foreign cattle trade for the London and other markets has now assumed a magnitude that imperatively demands CATTLE SHIPS (i. e., steam-boats built on an improved plan), especially for the purpose of conveying fat stock across the Channel from the continent of Europe. The construction of the present vessels is nothing less than a disgrace to every shipbuilder and shipowner in the United Kingdom. It is now upwards of four thousand years since the patriarch Noah built a large CATTLE SHIP, on nautical principles, that would put all our modern ideas sadly to shame. The details of the antediluvian method of accommodating cattle on board ship are unfortunately wanting, but the general outline of "lower, second, and third storeys" affords our shipbuilders very instructive practical information as to the requirements of cattle. Thus there was "a door in the side" of the big ship, the whole being water-tight, and having plenty of light

and ventilation. Again, the length of time Noah's live stock were on board proves that ample provision was made for their health and dietetic wants. In short, we only want the details, and perhaps a steam-boiler and paddle-wheels, to have a perfect model CATTLE SHIP, affording ample accommodation to all the surplus fat stock of the continent getting a pleasure-trip across to England. Such being our position, we are left the alternative of thinking for ourselves, *de integro*, as to details.

If we adopt three storeys, and put the steam-boilers, the coal, machinery, food for cattle, &c., in the lower one, it will leave the second and third storeys exclusively for man and beast, both of which would be above the water's edge in fine weather, resembling in principle a large war ship having three decks, no cattle being upon the upper one. The upper deck would thus be analogous to the quarter-deck, and would extend along midship to foreship, on a level with the gangway. The two departments for cattle could be ventilated in smooth weather, immediately under the deck over each department, by open side-lights. In rough weather a small additional steam-engine, wholly independent of those employed in propelling the vessel, would be required for the artificial ventilation of both departments, by throwing in fresh air and removing the foul when the windows and doors are closed to keep out the heavy seas that break upon the ship. In hot or close weather it might also be frequently necessary to keep the ventilating apparatus in full play.

The height between decks in the two cattle departments ought not to be less than from 10 to 12 feet clear.

We now come to the number of berths, including the dimensions of each, with its position in the department. The cattle, for example, could easily walk down a short gangway having an inclination of five or six feet into the lower depart-

ment, and up a similar incline into the upper one, the animals being walked gently each into its own berth, without experiencing any of that barbarous slinging and rope-torture so common under the present system. A trained ox, sheep, and pig might be kept at the embarking sea port on the continent, and also at the landing one in England, for calling or leading the strange cattle up and down the gangways. The effect of this upon all gregarious animals is almost incredible. It is a familiar practice with bird catchers and sportsmen, in some foreign countries; and farmers and cattle-ship companies ought to profit by the practical lesson thus taught them. It comes naturally to cattle thus to follow their leader; and were the trained ox or sheep allowed to make a short friendship with the tired strangers on shore, they would gladly follow him into the hearty welcome which they would receive. Sheep have been known to follow a pet one up-stairs, to the no small dismay of the domestics.

The movement of the vessel by the waves being greater transversely than longitudinally, it follows that large cattle should stand transversely across the ship. In small vessels there would thus be two rows of beasts—one on each side, with their heads to the sides of the ship and their tails to each other, an open passage being behind them along the whole length of the ship. The stalls or berths are thus ranged as they are in the feeding-house or byre of the farmer. In larger ships there might be three rows of cattle stalls, and two longitudinal passages, and in the Noahitic big ships four rows and two passages, the cattle in the two centre rows standing head to head, with tails to the side rows. Each ox-stall or berth should have a door behind, to slide upwards in a groove by two ropes and over pulleys.

Oxen, sheep, and pigs should be kept separate as much as possible, the strong air arising from the one being obnoxious to the other. Such being the case on land, it is difficult to say what the effects might be on health at sea, and what poisonous gases and contagious diseases may be generated. The lower department might be fitted up for oxen and the upper one for sheep. With twelve feet between decks there might be two tiers of sheep pens in each row, the one above the other. In other respects the sheep department might be fitted up so that it could carry oxen should circumstances so require. These are details which the demands of trade would soon regulate.

Pens for sheep and pigs would be of uniform size, but it might be otherwise with the stalls for oxen, the size of beasts being often very different. It would, however, be preferable to make the latter also of equal dimension, and all adapted for the conveyance of the heaviest oxen, and of sufficient width to allow animals being fed and in other respects attended to as at the homestead of the farmer.

The sides of the partitions of ox-stalls should be stuffed with straw, as in the case of railway trucks; and the method of stuffing should be so devised that fresh straw can easily be put in for every voyage, and the stalls and departments regularly washed out with water, purposely to keep them free from disease. The partitions could easily be stuffed in this manner by means of flat ropes or girthing, the straw being placed between the latter and the former. The decks should have a coating of some composition of sufficient thickness and imperviousness to protect the wood below, and of a character to prevent disease; and were it covered with peat charcoal, or even ground peat, a few inches in depth, with a little oat straw over, its value for manure would always fetch something more than its prime cost; so that the Cattle-ship Company would gain a

profit by paying proper attention to the littering and comfort of the stock on board (and this, we may here apostrophise, is the true method of doing things in a business manner).

On steam-boats we have generally found cattle—oxen, sheep, and pigs—better sailors than their care-takers. Our high-bred "Dukes" and "Duchesses" cross the Atlantic to America, feeding, lying, and ruminating with as much regularity and comfort as in the stalls which they left at home. But in a wholesale trade, like that for which cattle-ships would have to provide in rough weather, oxen should be compelled to lie at ease by casting them, and tying their fore feet to their hind feet, in the way veterinarians do when they intend to perform any operation upon them. For this purpose the animals should have broad straps buckled upon their legs, so that they could be tied and loosened in a moment's time, without any harm being sustained. Calves and sheep are thus tied by farmers, and conveyed in carts. Shepherds also tie their sheep when shearing them. Some calves and oxen, when thus tied, knock about for a little, but the moment they find themselves completely fast, and less the matter when lying still than when struggling, they soon choose the former alternative; and the same result would be experienced when at sea. Ill-tempered and restless animals should be tied even when the sea is smooth, in order to prevent disturbance to the rest of the stock.

Tying one, two, or three hundred head of cattle may appear, to those who have no experience in the management of live-stock, a work that could not be performed in time; but the contrary is true, for it must be borne in mind that almost all the cattle would be lying, so that by strapping their feet first, the few exceptions standing could be thrown in a twinkling; and besides, when men are experimentally acquainted with the practice, it does not take a long time to throw and tie the feet of an ox; and when once down and fast, little more attention is required for the rest of the voyage. Much of the success of any practice depends upon how it is carried out, and the tying of cattle on board the proposed cattle-ships, and the keeping of them from being tossed about, would be no exception to this rule, however well adapted ox-stalls, straps, tackle, and everything else might be for the purpose. Most untried schemes, when first proposed, are objected to by those who have become familiar to and are daily engaged in the practices they are intended to supplant. We have heard steamboats and railroads, for example, condemned as the wildest dreams imaginable, by men of position in society; but although prejudice may retard the wheel of progress, the demands of the cattle-trade and the disease amongst flocks and herds at the present time are too urgent to permit of a single argument to the contrary; for the enterprise at issue is ripe for action, so that if sea-faring people cannot understand the voice of reason, they will be taught by the more convincing language of experience how to tie a fat bullock with as much expedition as the shepherd ties his sheep in "clip-time," when he is paid by the long score for shearing the flock.

In each department there should be an infirmary for sick animals, apart from the sound ones; and every ship should carry an experienced veterinarian to attend to the health of cattle, and to prevent diseased animals being taken on board. If there should not be a sick animal in the infirmary for one out of ten voyages, that is no reason why a sick animal should be allowed to remain amongst the others, to spread contagion. It may be throughout the whole herd once in a hundred times,

Under this head it must be borne in remembrance that it is not merely the health of the cattle on board that is involved, but also the health of the cattle of the country and the health of its inhabitants, for whom the animals, both home and foreign, are intended to be slaughtered, to supply their tables with beef and mutton. At present the foreign cattle trade is in such a pestilential state for the want of proper veterinary inspection at the embarking ports of the continent of Europe, and also of Ireland, and sanitary means during the passage of cattle across the English and Irish Channels, as to call for immediate statutory interference by the Legislature; and the health of the people more imperatively demands this interference than the health of our cattle, amongst whom contagious diseases are now making such frightful havoc. In short, the present nefarious practice must of necessity be put an end to, one way or the other.

The size of the ship and the number of cattle is a simple matter of pounds, shillings, and pence, about which next to nothing requires to be said. It would not take a very large sea-going craft to carry in each department a hundred head of the heaviest bullocks sent to the London market, or a cargo of three hundred, there being three rows of fifty in the lower-deck, and a like number in the second storey; four hundred at four rows of fifty each; and six hundred at four rows of seventy-five each.

Would the project pay a CATTLE-SHIP COMPANY (Limited)? This is the finale; and however self-evident the pro-

blem may be in favour of the enterprise, it is nevertheless one of that peculiar character which is more than ordinarily liable to be bungled by seafaring people, simply because they have little or no accurate knowledge of how cattle are managed by farmers; while herdsmen and drovers are equally far from home, when at sea. That there is now a sufficiently paying trade, were it properly organised and conducted on the contemplated method of conveyance, no one can doubt who knows anything practically about the enormous loss now sustained. It may be difficult to convince foreign farmers of the magnitude of this loss, or to procure for them at the outset the full advantages to which they would be entitled, for it would of necessity take some time, for example, before London butchers and salesmen could ascertain the increase of weight and the improvement in the quality of the beef that would be realised. Like all other improved practices, the one in question would have to work its way onwards and upwards against a strong current of self-interest and trade prejudice; but against all opposition of this kind it would eventually triumph, and return the foreign farmer an increase of profit, after paying the Cattle-Ship Company remunerating interest on their capital.

The conclusion at which we have thus arrived is equally applicable to Ireland and those parts of the North of Scotland that ship their cattle to the southern markets. To the Irish farmer the project is a doubly interesting one, for proper cattle-ships are much needed to convey the fine cattle of the sister-country across the Channel. W. B.

BREEDING OF STOCK.

The question, Where are we to get our young stock? is assuredly becoming every day of importance; and even those who profess to place little reliance on the annual returns of the Registrar-General are forced to declare that there must be some truth in those returns; for it is evident on all hands that the supply of stock is not only far short of what is required, but also that it is getting manifestly less. Fairs which a few years ago were well supplied have now dwindled to such an extent that in many important departments the supply is often almost nominal, and we even hear of large tracts in some parts of the country where there is neither hoof nor horn at the present moment, although in past years such districts were tolerably well stocked. It is alleged that a want of capital prevents some holders of pasture land from keeping up these supplies as they were wont to do, and we believe this allegation is not without foundation; but this does not hold good everywhere throughout the country, and yet everywhere the complaint that cattle are scarce is heard.

This state of things cannot last. More stock must be reared and kept, otherwise the consequences will be disastrous to all parties. One obvious mode of meeting the difficulty is, as we have previously shown, to rear more calves from the cows we already possess; and along with this we require to have a greater number of breeding animals in the country. Thousands of calves have been annually slaughtered when newly born, or at most when only a few days old; and we would have this system abandoned as far as possible, by which means a considerable increase would be made in our young stock. There is nothing to prevent its being done; and if the calves have been bred as they ought to have been, they will pay for keeping them alive. And with reference to this we must say it is all nonsense breeding bad stock. It is a

loss of money and a loss of time, and we cannot understand how people with a grain of common sense in their heads can go on year after year breeding mere rubbish, especially when they have the opportunity of mending matters. But they will do; for we know that they often prefer a brute for the service of which they have only to pay 1s., rather than use a well-bred bull, for which, perhaps, 2s. 6d. is charged, although the calf got by the latter will bring, and they know it will bring, more than double the money that the other will fetch, when both are six months old.

With regard to the increase of the number of breeding animals in the country, the settlement of this lies with a different class of men than those to which the above remarks have immediate reference. It lies with men of capital and intelligence, who are feeling the pressure arising from the scarcity of young stock, because they must go into the market every year for a fresh supply, with which to stock their pastures. How is this to be done? We have ere now pointed out the only way in which it can be effected, and our views were corroborated by a correspondent of the *Mark Lane Express*, whose letter appeared in our last impression. The writer says, "The majority of graziers must breed their own stock;" and if this be true as regards English graziers, it is doubly so in the case of graziers in this country; for we have a great deal of land in pasture which cannot fatten stock, and which would be much more profitably employed as rearing farms, instead of becoming, as they now are, mere intermediate stages for cattle in the store state.

But if the holders of such land are to become breeders of stock, they must adopt a different system of management from that which they follow at present. To breed stock they must have winter food provided, and of that sort must form

a principal part. There is no use in shirking the matter; for if they will not grow turpins they cannot have stock, either in sufficient numbers or kept in that steadily progressive manner which is one of the essentials towards rendering stock breeding a remunerative pursuit. They must also have shelter by means of sheds and yards, which may be plain enough in the construction, but are, nevertheless, requisite; for it is not enough to fill the bellies of the beasts, but they must be protected from the wasting influences of the weather, that the food given them shall do all the good it ought to do.

The next point is to breed as good a description of cattle as possible. Not only must the bulls employed be well selected, but the heifers must also be chosen with equal care. A bull is, no doubt, a bull, and a cow is a cow; but neither the bull nor the cow may be the right sort to produce paying stock, and that is the thing to be kept in view. And when alluding to the quality of stock which should be bred, we consider it would be most advantageous were more attention given to a proper system of crossing, such as putting West Highland or black-poled Galloway heifers to thorough-bred short-horn bulls. This is occasionally followed in Ireland, and we often meet with capital specimens of such crosses; but with the exception of Mr. Pollok's cattle, it is rarely done on a systematic and extensive scale.

But say who have seen the beautiful cross-bred cattle brought out by that gentleman must be satisfied of the value of such stock, and the desirableness of their being more prevalent amongst us. The combine early maturity with hardiness, and good quality of meat when fattened—all most desirable points; and for these reasons the young stock of this kind bring high prices when disposed of by the breeder. We have frequently given instances of such, and as further evidence we find in the *Elgin Courant* of last week that at one public auction of stock, held the other day in that part of the North of Scotland, twenty-five yearling bullocks and heifers averaged £12 13s., and this was not, be it remembered, what is called fancy stock. The buyers were shrewd dealers and farmers, who must turn their purchases to profitable account; nor was it even an exceptional average, for other sales, both by auction and in the fairs, show similar prices.

To have good crosses there must be good bulls. Midding and inferior bulls will only produce disappointment and even less; and as we want stock, let us have it, we repeat, as good as can be produced, when we do set about filling up the immense gap which exists at present between supply and demand.
—*Irish Farmer's Gazette*.

THE FARMERS' CLUB.

THE CORN RETURNS.

At the usual monthly meeting held on Monday, May 2, the subject for discussion to be introduced by Mr. Chandler, of Aldbourne, Hungerford, was "The Imperfect State of the Corn Returns." The attendance of members was very small: it was the last meeting for the season.

The CHAIRMAN, Mr. T. Congrove, in opening the proceedings, said: The subject had been already discussed in the Club, but nothing of a practical character had come of it. It was well-known to all of them that farmers paid tithe corn-rents, and that while corn of the best quality was usually returned, a great portion of the inferior grain never was so. The mode of making the returns was altogether very imperfect, and he had seen enough in the *London Gazette* within the last few minutes to satisfy him that very many important towns made no returns whatever—a fact which showed that the system required amendment.

Mr. CHANDLER then said: The subject I have to introduce to your notice for this evening's discussion is one in which the greater portion of the agriculturists of this kingdom, and in many instances the landlords and tenants, are deeply interested. The fact that the annual income of so many persons is dependent on the manner in which the corn returns are made, shows how important it is that they should be taken correctly. In the proud position in which this Club now stands as the recognized organ of the farming interest, to once more thoroughly investigate these returns may be considered as an enquiry fairly within its province. As they have been on some previous occasions discussed in our lecture rooms, I must claim your indulgence should I touch on some points with which you are already familiar. I can scarcely hope to do more in the retrospective view of the corn returns (which in order to elicit facts I feel necessitated to take) than to notice the more prominent features which are patent to every one, and, like school examinations, repeat the early lessons with the addition of those more lately acquired.

Every year's experience still further demonstrates the necessity for a reform in these laws; and it is not the most difficult part of my duty this evening to prove the present system to be defective. How far we may be successful in providing a remedy is a problem yet to be solved. Some of the older members of this Club whom I see before me may remember the vexation and annoyance attendant on the old system of collecting the tithes, and the ill feeling it occasioned in too many instances between the clergyman and his parishioners, widely severing those ties of Christian mutual love which should ever exist. They cannot have forgotten, either, that the tithes, at the time I am referring to, were not only the tenth of the produce of the land, but, where it was liberally treated to increase that produce, it was also the tenth of the capital (money and skill) applied to that land—a system which materially impeded agricultural improvement. This state of things continued till the year 1835, when an Act was passed entitled "An Act for the Commutation of Tithes for England and Wales," by which the Commissioners thereby appointed were empowered to confirm commutations for the payment of annual sums by way of rent-charge, of a certain number of bushels, and decimal parts of a bushel of wheat, barley, and oats, to be paid by each parish in lieu of tithes; fixing the starting point of wheat at 7s. 0½d., barley at 3s. 11½d., and oats at 2s. 9d., that being the average of the previous seven years, the permanent payment of which was to be regulated by the averages taken by the Comptroller of Corn Returns from 297 markets, as published in the *London Gazette*. By the 56th clause in the Act referred to (6th & 7th of William IV.) it was provided that in the month of January in each year an advertisement should be inserted in the *London Gazette*, stating "what had been, during seven years ending the Thursday next before Christmas-day then next preceding, the average price of an imperial bushel of British wheat, barley, and oats, computed from the weekly averages of the corn

returns." Such is a brief outline of a bill which has been the means of putting an end to much litigation and angry feeling between the tithes owner and the tithes payer, the principle of which, I think, is admitted by both parties to be sound. It only remains now to inquire how the Act has worked in detail. The close connection that exists between the corn returns and the Tithe Commutation Act will, I trust, be a sufficient apology for my having adverted, although cursorily, to the latter. I shall confine myself to the subject now more immediately under discussion, and endeavour to point out to you what I consider to be the imperfection of the corn returns, as they are collected at present. I presume you are all aware that the return of corn sold is made by the buyer only. The purchasers of corn are the millers, factors, and maltsters, who pay, if any, only a small proportion of tithes, and have therefore little or no inducement to make the required returns. The local millers have a more direct interest in recording the highest priced corn they buy, and forgetting to enter the low priced, so that on returning from their respective markets they may inform their customers, from the best authority, the average prices; leaving them to draw their own conclusions as to the value of the wheat which would be required to supply the quality of flour they were in the habit of purchasing. This remark applies also to the maltsters and factors. There is another glaring inconsistency in this system of confining the making returns to the buyers only, which tends considerably to increase the averages. We may fairly assume that there is a certain amount of speculation constantly occurring in the corn trade. In such a season as the last harvest, the quality of the corn, especially barley, varies to a great extent. In situations where the corn was early ripe, and got in before the wet weather, the prices of barley have ranged very high—nearly double the price of that lying on the ground and sprouted. The best barley being very scarce, has, in many instances, passed through several hands, and has been returned two or three times, with the addition, at each sale, of the cost of transit and the factor's profit. Speculators seldom invest their capital on inferior corn. It is only the best and driest that can be depended on for storing either in bins or in sack. They therefore purchase the samples that command the highest prices in the market, and ought, under the provisions of the Corn Returns Act, to make a proper entry of it for the corn inspector. This is resolved when a satisfactory profit presents itself, and is again returned by the second purchaser. These, I have reason for believing, are by no means isolated cases, and must consequently influence the averages very unjustly. Owing to the annoyance and inconvenience which these returns occasion the purchasers by making their entries at the close of the market, there are some who are not very particular in conforming to these commands. One miller and maltster, attending his market every week, told me very candidly, that he had never made a return of a quarter of corn since the repeal of the corn laws; and others have declared that they did so only when it suited their convenience, and of such quantities as they thought fit. The secret manner in which the return papers are conducted, prevents, in a great measure, the detection of those persons who may neglect to comply with the terms of the Act, and to some extent accounts for the few convictions that have been made public. If a seller of corn goes to the inspector, and asks him if the person (whose name he gives him as the purchaser) has given him an account of such sale, he (the inspector) tells the seller that his office is only to add up the totals,

strikes the average, and send it to the comptroller, politely declining to give him any further information. In looking through the list of markets at which the corn returns are taken, as published in the *London Gazette* of January last, I was struck with the insignificant quantity of corn sold in many of them. Out of the two hundred and ninety-seven markets, there are seventy-four in which there is no wheat returned, and twelve others in which there is not more than twenty-five quarters; while of barley, one hundred have made no return, and forty-three of the remainder do not exceed fifty quarters. Of oats the returns are merely nominal. There are no returns of that grain from one hundred and sixty-three markets, and sixty-seven more of not more than fifty quarters; and the total sold in England and Wales is stated as under 19,000 quarters. These statistics demonstrate clearly that a small portion only is returned. Anyone acquainted with the different localities, and knowing the corn-growing capabilities of many of the districts in the list referred to, will, by comparing them, see that the quantity of corn recorded in it depends very much on the zeal with which the several local inspectors perform their duties. My own observation confirms this idea; for in some of the minor markets, in districts which are not so well adapted for the growth of either of the kinds of grain as others, and where the real amount of business done is much larger, the returns in the former are considerably in excess of the latter. I will now direct your attention to another phase of this subject which materially affects the corn averages. Before the repeal of the Corn-laws, the principal remunerative item grown on a farm was supposed to be corn, and more especially wheat. The experience of nearly twenty years has dispelled that delusion, and now the universal opinion is in favour of stock-breeding and feeding. The high price of meat, and its increasing consumption, demands the greatest exertions from the agriculturists to furnish a corresponding supply; and with the present commercial prosperity of this country, we may naturally conclude that it will be some years before that demand will decrease. To stock-rearing and feeding, then, the farmer will devote his energies, as the chief means by which to make his rent. For many years past the consumption of oilcake and foreign feeding stuffs has greatly increased, which in the former has led to great adulterations, and has driven the stock-master to consume grain instead. I should suppose that in no previous year has there been so large a quantity of corn consumed by stock as in this. The low price of all kinds of grain, and the difficulty of finding a better market for it, has been an inducement to feed cattle with it, thereby saving the expenses connected with it in cartage, &c. We will now investigate this matter more closely, and see how the present system of collecting the corn returns has accorded with the original object of the Legislature, as regards the tithe. There can be no doubt that it was intended by the Tithe Commutation Act to ascertain, as correctly as practicable, the average price of a bushel of wheat, barley, and oats during the year; and in order to obtain this information as correctly as possible, it was presumed that, by compelling the dealers in corn to make a weekly return of all the grain purchased by them, a fair proportion of all qualities of corn would be returned. At the time when this Act first came into operation, no one could have conjectured the change that has since taken place in the meat market, and therefore the enormous amount of low-priced corn given to cattle could not have been anticipated. As it stands at present—this year in particular—

nearly every farmer is feeding some portion of his stock with his inferior corn, sending to market that only that would command the highest price. I had hoped to have had it in my power to submit to you some statistics, showing the ratio between the quantity of corn produced and that sold in the market, on a sufficient number of farms to warrant us in forming an opinion as to the relative quantity consumed at home, and the difference in value between the samples so consumed and those sold. Many friends have given me the result of their experience on this point, but their letters reached me too late to enable me to analyze them carefully, and I content myself with making some brief extracts.

From Mr. Charles Howard, Biddenham, Bedford: "With regard to the returns of corn purchased in our market, I should hardly think one-quarter of it is so reported to the inspector; in fact, it is quite a farce, and so looked upon by all business men. Of course such a state of things cannot but be injurious to farmers, for reasons I gave in a former letter. I have a case now pending, where the crops were taken last harvest, the price to be fixed by the average price on three market-days of the Bedford market. Well, it so happens that the returns come out at about 1s. 6d. a quarter for wheat more than really was the case; for beans, the price was such clearly showing they must have been old ones. A better system should be at once enforced, or abolish altogether the present. There is a very great deal of corn consumed by the farmer, mostly the inferior qualities. I have this year, out of 465 quarters of barley, consumed nearly 220 of it; besides all tail wheat, and the peas and beans I grow. It is true I do not have more than about 18 to 20 acres of the latter in a year. A large quantity of wheat has been ground down for stock during the past season. I know many farmers who sell nothing but their wheat and a few oats, consuming all the beans and barley they grow."

From Mr. Edward Little, Lanhill, Chippenham: "I have made the best enquiries relative to the corn sales at Chippenham and Bath. Chippenham is very uncertain, but several purchasers and sellers agree in fixing the average quantity of wheat at 200 quarters per week, and barley for the winter at 150 quarters per week. The return for the last week (which took in the great market day) was 450 quarters barley. From the best information I can obtain relative to the quantity sold at Bath, I estimate the average quantity of wheat sold at from 350 to 400 quarters per week, and about 250 quarters barley per week. Bath is now a very important market, and generally well attended by dealers, and well supplied with grain."

From Mr. Machi, Tiptree Hall, near Kelvedon, Essex: "I generally consume one-third of the corn I grow. This year I shall use 90 qrs. of oats, 120 qrs. of beans, and 15 qrs. of barley. Of course no return is made of this quantity. Occasionally much wheat and other corn is sold, without going on the market at all. There has been a large quantity of wheat (principally rivett) used in feeding."

From Mr. Lowsley, Manor House, Hampstead Norris: "I have been requested by Mr. Owen to write to you respecting the averages for this county, as I have a memorandum by me that no corn was returned (wheat excepted) at Reading Market during the month of June last, excepting June 8th (36 qrs. barley): so that, if we are to believe the returns, neither barley, oats, beans, peas, or rye was sold for a whole month in our county town. Such is the lax manner in which they are taken. No doubt the growers should make the returns; but I think there will be great difficulty in getting a return from them, unless under very stringent rules."

From Mr. Duckham, Baysham Court, Ross, Herefordshire: "Of course you have for some months past watched the corn returns: from them you will see our county is returned ridiculously low as regards the quantity sold, and as the price is one of the lowest averages in the kingdom, it is obvious a manifest injustice is done to the tithe payer and those whose rents are regulated by the corn averages. I quite agree with you that the growers of corn should make a return also. I feel that the whole of the growth and its value should be returned; but here arises a difficulty—the facility for fraudulent returns, otherwise I feel an injustice is done to the growers: for instance—nearly one-half of my barley was too

much stained for malting last year; consequently, owing to the malt duty, I had either to sell at a ruinously low price, or consume it with my own stock. The latter has been the course I have principally pursued. Thus, whilst our barley averages are ruling some 20s. to 23s. per qr. for inferior quality, and 36s. for malting purposes, a very small proportion of either is returned as sold; but the little that is, generally rules the higher figure. As regards the detail of working the whole matter, I quite think with you that the Inland Revenue Office should do it, and I also think they should have the full working and collecting of the property and assessed taxes; and I also think your contemplated arrangement quite feasible."

The foregoing observations have been confined to wheat and barley. They also apply more particularly to oats. I shall not exaggerate when I say that less than half the oats grown in England and Wales are noted in the returns. In support of this assertion, I must again call your attention to the *Gazette*. The 17 Welsh markets are quoted there as having sold in the week ending January 30th, 1864, 1,537 quarters 1 bushel. This is in a notoriously oat-producing country; or if not, it would be hard to say what it does grow: as the same 17 markets for the same period have made a return altogether of 414 qrs. 3 bushels of wheat and 681 qrs. 2 bushels of barley. So much for Wales. There are comparatively but few farms in this country that do not grow some oats, except in the first-class wheat and barley soils. On farms such as fen and down lands, where they are the staple produce, the tailing is given to the horses during the winter, and the best are sold, reserving sufficient only to keep the horses the rest of the year. These are often bought by corn-factors at the latter part of the spring of the year, at a low price, when the markets are over-stocked, and stored away till the following harvest, when they will be wanted as old corn for race-horses and hunters. They are then sold to some person whose business it is to supply racing and hunting stables, who can afford to give the factor a good price for them. This man being a *bond fide* dealer in corn ought to make a return, which he would do at the fall price he bought it at. This would, of course, be the second return, with the profit of several shillings per quarter in addition to the first sale. To further prove the deficiency in the returns of this grain, we will take another class of consumers of oats, and that by no means an inconsiderable one, whose corn does not appear in those returns: it is that of noblemen and gentlemen farming their own estates, who keep large establishments of horses; they get their supplies from their farms, and if they are not sufficient their bailiffs are ordered to buy what further quantity may be required at the markets they attend, or direct from their tenants. The bailiffs not being corn-dealers make no returns either of the purchased corn or of that grown by themselves. This is taking place weekly in nearly every one of the 297 markets, which will to some extent account for the small amount of oats returned. There is another feature in connection with this part of the subject, which I had nearly overlooked. Since the introduction of improved thrashing and winnowing-machinery all sorts of corn are much better separated than formerly, thereby increasing the weight of the sample, and consequently obtaining a higher price in the market, leaving more seed grain to be disposed of amongst the stock at home. Incidents such as these, trifling as some may think them, have a tendency to operate unfairly in taking the averages. Whilst preparing this paper I was favoured with a letter from a friend who attends Reading market, in which he states that

he made a note from the corn returns of that market in the month of June last, to the effect that during the whole of the month of June there was no return of any kind of grain but wheat, except 36 quarters of barley. I might pursue this part of my subject much further, but I will not trespass longer on your time than I am obliged to. I trust I have laid before you sufficient facts to prove that the returns should not be made by the *buyer* alone. I have no hesitation in saying it should be by the *seller*. Although this plan may meet with general approval, still I am aware that it is open to objections. It may very properly be surmised that the farmers themselves may be more loose and careless in complying with this injunction than the buyers. That unless there was some scheme devised that would give but little trouble, and would at the same time prevent any unnecessary exposure of their market transactions beyond the inspectors, I readily admit it would not be favourably received. The above remark would, I should hope, refer to a very small portion of the agricultural body. The importance of the subject, however, demands *some* amount of inconvenience; but I cannot see that it need give more than it would to fill up an assessed tax paper; the only difference would be, that we should wish that it may be required to be done oftener. The old adage, that it is easier to find fault than to provide a remedy, is quite true in this case. But as I have readily undertaken the first part, I will not flinch from my duty by shirking the second. I will venture to suggest the following scheme, although I know that in doing so I shall lay myself open to criticism. When a man throws his hat into the ring he should be prepared to do his best, and I feel confident that the attempt will be received in the same spirit in which it is given. I would propose: 1. That every grower of corn shall make a return, within — days from the time of delivery, of all wheat, barley, and oats which had been grown and sold by him, with the date of such sale, the name and address of the purchaser, and the price at which sold. 2. That districts shall be formed throughout England and Wales, similar to the Rides or Divisions of the Inland Revenue Officers. 3. That a local inspector shall be appointed for each district. 4. That the local inspector shall ascertain the names of all growers of corn within his district; to enable him to do which, he shall have a right to inspect the overseer's book in each parish for that purpose. 5. That the inspector shall, on first entering on his office, send to each of the growers of corn a printed form, with headings for the entries before mentioned; and at the bottom a declaration, that the several entries in their respective columns were correct returns of all wheat, barley, and oats grown by him, sold since the date of the return he last sent to the inspector. 6. That, in addition to the return papers, envelopes with this printed direction, "To the Inspector of Corn Returns, — Division," shall be sent by the inspector to the grower. 7. That every post-office shall be the receiving place for the corn returns of each parish or hamlet in which it is situate; and that on — day in every week the postmasters at their respective offices shall forward the corn returns received at their offices to the inspector appointed to their particular Division. 8. That every grower of corn, who shall neglect to send their corn returns, either directly to the corn inspector of his district or to his (the grower's) usual post-office, agreeably to the form before mentioned, shall be subject to a penalty not exceeding 40s. 9. That half the above penalties shall, on conviction of the offender or offenders, be given to the informer.

In laying before you this brief sketch of what I believe would be an improvement on the system now in use, I do it with a view of eliciting the opinions of the Members of this Club, and sincerely hope that having made the attempt abler heads may bring it to a successful issue. There is one of the evils I have alluded to, that of the non-entry of corn of home growth consumed on the farm, which I have not attempted to devise any plan to correct, for the simple reason that I could not find one that would efficiently meet it. The difficulty is to know in what way the real value of the corn which is not taken to market can be ascertained, in order that the inspector, and through him the parties interested in it, may be satisfied of its correctness. This is a part of the subject which should not be lightly passed over, as without these returns the averages would still be very incomplete. The consumption of corn by stock, owing to the high price of meat, will undoubtedly largely increase for many years to come, which renders it more particularly requisite to make a provision to secure a proper return of it. I must explain why I have been so minute in proposing that envelopes with printed directions should accompany the printed return papers. They were not so much to save trouble to those for whose use they were intended, as to ensure regularity of delivery from the postmaster to the inspector. Even if a distinct box was specially provided at the post-office for their reception, it may happen that the messenger sent to post them may, through mistake or ignorance, drop them into the ordinary box, which, from being printed, would be easily detected, and be despatched on the day appointed for them. The plan I have proposed will undoubtedly cause an increase of work at the post-offices, and it may require an assistant clerk at each of the Inspector's offices; but this would be of very small moment when placed against the advantages to be anticipated from a more improved system. A thing worth doing at all is worth doing well. Certainly these returns, affecting the averages to ever so small an amount on a total so large as the tithes of England and Wales, producing last year no less a sum than four millions sterling, deserve to be carefully looked after, even if the expenses of collecting them should be considerably more than they are under the present unsatisfactory manner of taking them. The average of the last 28 years was £101 1s. 7½d. It were better to have no returns at all, and pay a fixed yearly amount for tithes, rather than be subject to such variations as the present imperfect machinery produces. As it is not the wish of this Club to disturb the original settlement of the tithe question, therefore in a truly conservative spirit it desires only to reform those errors which time and experience have proved to exist in the corn return department, which is so intimately connected with the Tithe Commutation Act as to become the mainspring of the whole system. In discussing this subject, we cannot be accused of having entered on it prematurely, before it had been fairly tried. It is now twenty years since the introduction of the corn returns, during which time it has remained *in statu quo*—no enquiry has been made by the Legislature as to its merits or demerits. Surely it cannot be that it is so complete in its working that it requires no amendment, nor is it a defect but recently discovered. The Journal of this Club will show, that as far back as 1854, and again in 1856, the same complaints were brought against them then as have been mentioned this evening, and that the Board of Trade were made cognisant of it through the deputation that waited on that honourable board. A member of our committee remarked, when fixing the subjects for discus-

don for the present year, and on this being proposed, that it had been worn "threadbare." The arguments may indeed be threadbare, but the facts remain unaltered, and the abuses still exist as forcibly as ever, and will in all probability continue so, unless strong persevering efforts be directed to the proper quarter from whence relief is to be expected. I do not wish to detract at all from the praiseworthy efforts made by this Club in the same direction, in the years before-mentioned, or to insinuate that no benefit was derived from their exertions on that occasion: far from it. As it is not the first shot that is expected to demolish a hostile battery, neither ought it to be supposed that the first attempt to remove a parliamentary grievance will be successful. To fully ventilate this subject by a temperate discussion is the most certain way to arrive at facts; and when they are satisfactorily proved, as I believe they will be before the close of the meeting, the point to be attained should never be relinquished till it is carried. Perseverance alone will accomplish this. Knowing but little of parliamentary tactics, I must leave it to others better versed in them, as to what quarter to apply for relief in this matter. Although we may not have an M.P. with us this evening, we may congratulate ourselves that our agricultural members at this time are particularly desirous of rendering their services for any business that may be proposed to them—one of which should be to move for an enquiry into the corn returns. Whether this enquiry should be through the Board of Trade or Parliament, there is one thing quite certain—that it is the duty of this Club not merely to reiterate the imperfections of the corn returns, which have been acknowledged by the officials of Government, and universally admitted, but to resolutely and determinedly set to work to amend them. High as is the position in which this Club now stands, by having disseminated so much practical information through the medium of its lectures, yet the fact of its possessing sufficient energy and union to enable it to remove grievances such as the one we are now discussing would greatly add to its well-earned popularity, and evince to the public that it is ever watchful over the interests of those it represents, and ready at all times to defend them against injustice and oppression.

Mr. J. NASH (Reed Court, Rochester) observed that on looking round the room he felt there was no man there more interested in this question than himself. They might perhaps be surprised to hear that he paid three tithes, although he grew but one article. To him the corn returns were everything, for he had a very clever vicar in his parish, that took good care both to look after his tithes and to look him up as the payer of them. When he mentioned that he paid more than 80s. per acre in tithes, they would see how deeply he was interested in the question; and he for one thanked Mr. Chandler for having brought it before the Club, for owing to these false and fictitious returns being made, the tithes had greatly increased. He (Mr. Nash) was a grower of hops; and he did not produce a single blade of corn; he had to pay to the Bishop of Rochester a tithe-rent charge. He had next to pay the clergyman his small tithes; and lastly, he had to pay to the same clergyman an extra charge for growing hops. Thus he paid three tithes upon only one crop. If that was not a case worthy of the notice of the Club, he did not know what was. He had asked the Chancellor of the Exchequer to come down and see his little plot of ground, and judge for himself whether a man ought to live under such a system of taxation. He thought, however, that the matter was one that

rested with the farmers themselves, for he believed that when they had truth on their side, they would always find men in high places ready to assist them. All that they had to do was to put before them a plain straightforward statement of the case (Hear, hear.) He had never thought it right to go to any Chancellor of the Exchequer and throw dust in his eyes; but when they could make out a plain case, he was quite sure that the Government would be ready to assist them (Hear, hear).

Mr. T. B. DRING (Claxby, Spilsby) paid between £200 and £300 a-year in the shape of tithes; and the mode in which the corn averages were taken caused him to disburse considerably more than he had contracted to do. That, however, is not the only grievance of which he had to complain; for the practice of representing measure by weight entailed a considerable additional charge upon him. His tithes were paid on the average price of a bushel of wheat, of barley, and of oats; and this bushel being, in each case, represented by a much larger weight than it ought to be, the average was raised in proportion. He had been making a little estimate on this subject, of which he would state the results. In that part of the country in which he lived (North Lincolnshire) he found that upon an average of years wheat was about 60 lbs. per imperial bushel. That was 17 stone 2 lb. per sack, or 34 stone 4 lb. per qr. Barley weighed 53 lbs. per bushel, or 13 stone 3 lbs. per sack, or 30 stone 6 lbs. per qr. Oats were about 37 lbs. per bushel, 10 stone 8 lbs. per sack, or 21 stone 2 lb. per qr. But in paying his tithes, instead of calculating them up to wheat, which he really grew, and which was what was intended by the Legislature, he paid upon the assumption that it was 18 stone to the quarter. The merchants objected to buy wheat by imperial measure, because the railway companies allowed them to carry a given number of quarters as a ton—an arrangement which saved a great deal of trouble to the companies, but which affected very injuriously the tithe payer. He found that for every ton of wheat the companies would carry 5 quarters, or 10 sacks, at 18 stone per sack—or an excess of 20 stone upon every ton upon which he had to pay tithes. They sold barley at 16 stone a sack, or 32 stone a quarter; and there was thus an excess of 32 stone per ton upon the weight which they grew upon an average of years. Oats were sold very irregularly; and, although they did not really weigh more than 10 stone 8 lbs., they were sold at 11, 11½, and 12 stone per sack, which yielded an excess of 24 stone for every ton. Putting wheat in round numbers at 7s. per bushel, there was added about 2s. 6d. per quarter, or £4 9s. on every £100 of rent-charge (Hear, hear). He thought the mode of taking the averages very inaccurate. In the first place, the averages ought to be taken from the grower. It was intended that the grower should pay on a given number of bushels in lieu of tithes; but the average was taken, not from the grower, but from the merchant. Now wheat is forwarded from Lincolnshire to Leeds, Wakefield, Manchester, Sheffield, and various other markets, at an additional cost, for profit and transit, of something like 4s. per qr.; so that if they took a fair view of the grower's price, they would see that the merchant's profit and expenses would make it 4s. more than what was really the case. But a profit was often taken two or three times over. The merchant in the first instance took his shilling: it was then sold and sold again, the merchant each time taking his shilling; and thus the price was considerably raised beyond what was paid to the grower. Supposing they only took the addition of the market price, that would be equivalent to £3 10s.

or £8 11s. on every £100 of rent-charge. If to that they added the additional charge arising from using weight to represent measure, the result would be a payment of £8 for every £100 of rent-charge (Hear, hear). The average on barley was 8s. 11½d. per qr.; and adding 1s. 7½d.—the difference which arose from selling by weight instead of by measure—the difference upon every £100 of rent-charge would be £5 2s. 4d. If they added 1s. 6d. per qr. for the merchant's profit on resales and carriage, or half the cost of 8s. profit and carriage between the grower's and consumer's price, the total difference would amount to £9 18s. 10d. per £100. As regarded oats, the use of weight instead of measure would give £3 8s. 3d. per £100, and the difference arising from taking the price from the merchant instead of from the grower would amount to £5 18s. 9d., making a total of £9 0s. 2d. per £100 of rent-charge. It resulted, therefore, that, whether they took wheat or oats or barley, the farmer was called on to pay about nine per cent. more than he ought to pay according to the Act of Parliament (Hear, hear). Then came the question, how they were to get relief? That was a matter well worth the consideration of the Club. It was of no use discussing such questions, unless they followed up their debates practically and sharply—unless they put their shoulders to the wheel, and endeavoured to obtain relief if that was possible (Hear, hear). At the same time, he would admit that the evil he complained of was not exactly the fault of the Act of Parliament; but it was to some extent the fault of the farmers themselves. They were directed to sell their corn by imperial measure, and they did not do so. The reason was, because the merchants refused to buy by measure; for, seeing that they could get 20 or 30 stone in every ton carried in excess, they practically got a sack per ton carried for nothing. That was a very good reason why they should refuse to buy by measure; but it was no reason why the farmers should not endeavour to obtain a remedy for their grievances. It was, in fact, their own fault that they represented measure by weight. He had himself tried to break through the system many times; but he had found that the merchants would not relinquish it, unless he would sell at a loss considerably greater than the extra amount which he paid as tithe. As regarded the averages, he thought they wanted an alteration of the law. The averages were taken in a great many different towns; but if the law stated that they should be taken from the grower, and not from the merchant, the system would be much fairer. As Mr. Chandler had observed, there was another difficulty that ought to be got over—namely, the returning of inferior grain, barley for example, which they consumed in feeding their stock, and which was not worth so much by 8s. or 10s. per qr. as that which was returned. If that inferior corn were also included, it would of course considerably reduce the average. He believed that the clergy had no wish that their parishioners should pay more than was really fair; but such was the operation of the present law, that he believed it was really done. He should be very glad to render any assistance in his power to obtain a better system than at present existed.

Mr. SPENCER SKELTON (Sutton Bridge, Wisbeach) said: It might be supposed that with his experience he was able to judge in some degree of the contents of the paper which had been read; and he should be very happy to assist Mr. Chandler in his efforts to obtain a remedy for the evil he had dilated upon. Having been a corn-merchant for nearly 40 years; and having lived in an agricultural district nearly all his life,

he had had plenty of opportunities of seeing the practical abuses and defects of the present system. Those abuses had been so well described that he need not attempt to add anything to what their friends Mr. Chandler and Mr. Dring had said—namely, that the effect of the present system had been to increase the value of corn by adding to its natural weight. The origin of this evil was no doubt the custom of the railways in allowing so many sacks a ton, without considering what it really weighed. He had known farmers sell what really weighed from 56 or 57 lbs., at 63 lbs. per bushel. He had known wheat sold in Boston and other markets at 18 stone per sack, which really weighed something like 16 stone. The question was a very difficult and knotty one, and their efforts should be directed not only to expose abuses, but to find a remedy. The existence of the abuse, indeed, was so clear that there could be no question about it. In his own business he had bought wheat which had been purchased in the same market; and he had perhaps met with an anxious buyer the same day, and had sold it to him. Every buyer was bound, as the law stood, to make a declaration before a magistrate in the market he bought at, that he would make a fair return, the object of the law being to get at the real value of corn. The law said, "You shall return all you buy." There was no escape from that, and he regretted to say that the result often was to add very much to the value of the tithe. He had always been an advocate for selling by measure instead of by weight; for then the tithe-owner would be justly treated; whereas the present system, as had been shown, added 8lbs. to every 60lbs.; in other words, it caused an addition to the tithe of 5 per cent. at once; besides which, there was the effect of the re-sale and the transit of corn. He quite agreed with Mr. Dring that the increase of value paid to the tithe-owner was from 7½ to 10 per cent. (Hear, hear). He believed also that more than two-thirds of the buyers made no returns at all. They must bear in mind that a new system had come into the corn trade. The railway system had brought in a great number of small dealers, many of whom made no declaration or returns whatever. He did not wish to pass any censure upon a zealous and energetic body of men; but he must say that not having been brought up as merchants they never dreamt of obeying the statute, although in the aggregate they bought very largely. As to the clergy, no doubt they were like other men—they looked after their own interests. He did not believe that as a body they desired to overreach other persons: their object was simply to obtain what they conceived to be their due. The law said, "You shall return the value of produce," and consequently the returns ought to be made by the grower. Produce ought, at any rate, never to be returned twice (cheers); and that was a point which he thought ought to be pressed upon the legislature. They did not want to go into the knotty question of reconsidering the tithe rent-charge Act, for that would be a most difficult subject to grapple with. It would open up a great many difficult topics, and cause a great uproar in the country; but they must endeavour to get a remedy in the best way they could—that remedy might, he thought, be very easily supplied. In the first place the farmers ought not to pay any of the expenses connected with the averages, but the Board of Trade ought to provide the requisite printed documents. As regarded the growers, it might be objected that there was a great deal of indifference amongst them. Some said, indeed, that the farmers as a class were careless, and others that they were ignorant, and would not

take the trouble to give in those returns. Nevertheless, he thought that the carelessness, indifference, and ignorance, which might exist, were no excuse for the evils of the law (Hear, hear). He thought they could not do wrong in attempting to obtain such a change as Mr Dring had suggested; for he had no hesitation in saying that, as the thing now stood, farmers paid from 5 to 10 per cent. more than they ought. That was surely a matter that called for a remedy (cheers).

Mr. J. THOMAS (late of Dibden, Southampton) thought that there had been a great deal more disparagement of the present mode of taking the averages than it really deserved. What he meant to say was, that that mode afforded a nearer approximation to the truth than many gentlemen in the room appeared to suppose. He dared say there were many present who remembered that the old corn law did not allow the importation and sale of foreign wheat unless the price in England had risen to an average of 80s. per quarter. At that period the great care of the corn dealers, and especially of those who had hoarded up wheat for a long time, was to increase the last few shillings of price, so as to make it run up to 80s., in order that they might bring in their corn perfectly free of duty. That was their great object, and in order to obtain it they adopted the most reckless and unprincipled measures. Under that system the price of corn was returned three, four, five, or six times a day, and the returns were taken as if these were *bonâ fide* sales. Afterwards a better system came into operation. Then came the reduced scale, which fluctuated with the varying prices. Finally there came Sir R. Peel's first corn bill. Still there was the same inducement to raise the prices by fictitious sales. That law, however, no longer existed. Under any circumstances corn might now be imported on the simple payment of a shilling per quarter—an arrangement which was not so much a fiscal regulation, as a mode of registration. There was, therefore, no longer any inducement to corn-dealers to falsify the averages which were now given, nor, indeed, did he believe that they did so. The objects for which the corn duty was now levied, and reports of sales required, were two—first, to ascertain, for statistical purposes, how many quarters of wheat were imported in a twelvemonth; and secondly, to provide for the working of the Tithe Commutation Act. He did not think they could possibly take into account the corn consumed by farmers, nor could they mix up the two ways of selling their grain, by weight and by measure, as had been suggested by Mr. Skelton. He believed the country would be unanimously of opinion that they must either sell by weight or by measure, but that they could not sell both ways. He perfectly recognised the difficulty which arose from wheat which weighed 58lbs. being put down as 68lbs., but he did not see how the Legislature could interfere with that, or how it could impose selling by measure irrespective of weight.

Mr. SKELTON: Corn was now sold by measure.

Mr. THOMAS thought that Mr. Skelton had advised a sort of compromise between sellers by weight and sellers by measure.

Mr. SKELTON said his object was merely to simplify matters.

Mr. THOMAS did not wish to be misunderstood. He had already stated that the law might recognise either weight or measure, but that it could not recognise both. He fully concurred in the remarks that had been made with regard to the clergy of England. He felt sure that they did not wish for false returns. What they wished to obtain was in harmony with the Act of Parliament, namely, the true price at which corn was delivered. When there were differential duties, the object of the law was to know the price at which corn was

sold to the poor man; and at the present time, what interested Parliament was not what was consumed in feeding stock, but what was the price at which bread could be bought. The only honest and fair way of getting at that would be for every farmer throughout England, who was a wheat grower, to be compelled by Act of Parliament to return all the wheat which he sold—a thing that might easily be done through the medium of the collector of assessed taxes in each district forwarding a return to a central office. He thought the dealers should also be obliged to return the price at which foreign corn was sold in the English market. If that were done, we should have the true average price at which corn was sold. The two things, however, should be kept perfectly distinct.

Mr. SKELTON observed that foreign wheat was not at present returned at all.

Mr. THOMAS did not see why it should not be returned as well as British wheat, because what they wanted to know was the average price of wheat in the English market, so far as it affected the price at which bread was sold to the labouring classes. If they could obtain the two things he had mentioned, namely, returns from the English grower and from the corn-dealer, they would possess the means of arriving at a just conclusion (Hear, hear).

Mr. CLAYDEN (Littlebury) differed entirely from Mr. Thomas in what he had said respecting foreign corn; for, in his opinion, foreign corn had nothing whatever to do with the returns, as the Legislature intended the averages should represent the price of home-grown produce. On the other hand, he agreed with Mr. Chandler, the averages required attention, but that there should be a joint return made by the grower and the merchant (the first purchaser). With regard to the corn consumed on farms, he could not see why it should not be brought into the averages. If a farmer sold his offal corn to another in an adjoining parish, at perhaps 20s. per quarter, it did not appear in the returns, and of course the average was so much higher than it ought to be. He thought that Mr. Dring was right in saying that transit and numerous re-sales did, in truth, raise the tithe to the grower. As to the custom of the railway companies, he did not see what that had to do with the corn returns. It appeared to him to be simply a boon to the merchant, who had 20 stone a ton carried for nothing.

Mr. SKELTON: But if it increased the value, that fell upon the tithe payer.

Mr. CLAYDEN: Not unless it was sold by weight; and in his district that was not the case. In Liverpool and the northern districts persons had endeavoured to introduce the practice of selling by weight, which would perhaps be a great advantage to the merchants, but none to the growers. He thought that Mr. Chandler must agree that it was desirable that there should be a joint return (Hear, hear).

Mr. H. TRETHEWY (Silsoe, Amphilh) had heard a great deal that evening from which he must differ. In the first place he differed from his friend Mr. Chandler with reference to corn consumed at home being taken into the averages. He thought that that would be manifestly unjust, and for this simple reason: The measure of 1836 had been founded upon returns which did not include corn consumed at home; and therefore he did not think that the present returns should include it. And here he might remark with what accuracy the Tithe Commutation Act appeared to have worked. In the year 1836 the averages were taken at 7s., 4s., and 2s. 9d.; and those who had watched the working of the act since that period must have been struck with the correctness of those averages. There had occurred, four or five times over, a cycle of something like seven years, and the averages had, he believed, always been correct within 10 per cent., over or under.

That result appeared to him very remarkable; and he thought it was very questionable whether the matter under discussion was of so much importance to the farmers as had been represented. That it was a matter of some importance to them he willingly admitted; but it was not so much a farmer's question as a landowner's, (for a considerable portion of the land of this country was let tithe free. In that case the landowner had to pay the tithe, whatever it might be. There could be no question whatever that the Legislature intended land to be let tithe free, because the act did not give the tithe owner power to recover personally from the occupier, as was the case before the act passed. The only remedy prescribed to him was a distress upon the land; and it was, therefore, the interest and duty of the landowner that his land should be let tithe free. Suppose a farm were let subject to a tithe-rent of £100 a-year, and the tenant were two years in arrears, the landlord and not the tenant would be liable. Just see how the thing worked. Suppose that a clergyman or his agent applied to a tenant for his tithe, the poor man might say, "I am sorry I cannot pay you now, but if you will wait a little I will do so." Presently a distress would come in, and his stock would be swept away. It was clearly against the interest of the landlord to allow that. He thought the returns could hardly be taken from the grower, because he was the tithe payer, and was an interested party. Clearly the merchant, who was disinterested, would be the best person for the purpose. How far a combination of the two would act, he would not take upon himself to say. On the whole, he was inclined to think that the grievance was not so great as it appeared at first sight to be. Comparing the condition of English agriculture now with what it was before the Tithe Commutation Act, he thought they had to congratulate themselves upon the change. Let him remind them of the hardships they used to labour under. Many of them were old enough to remember that just before harvest the tithe owner came and put what price upon their produce he pleased, and if it was not paid, he took his tithe in kind. He would leave the meeting to imagine what annoyance and loss that occasioned. Could any one suppose that the great agricultural improvements which they had witnessed could have been carried out under the old system of tithe? (Hear, hear). What- ever, therefore, of inconvenience and disadvantage there was connected with the present system, they could see that, as compared with the old one, they had every reason to congratulate themselves. With regard to the clergy, their position was no doubt also improved: they had, it was true, a claim before to act, but it was difficult to enforce it, and now they had the security of the whole of the land (Hear, hear).

Mr. T. OWEN (Clapton, Hungerford) thought the grievance had been very clearly explained by Mr. Chandler. What they wanted was, a fair and just average of the corn grown in the country. He thought that it was scarcely possible to overrate the disadvantage and injustice of returns taken as they were now done, as not only the tithe and corn rents, but all valuations were ruled by the averages. It must be remembered that the millers were very naturally fond of having returns made upon first-rate qualities of corn; but there were many little men who came into the market and bought inferior corn, which was not returned at all. Corn of inferior quality, after being rewinnowed and mixed, was taken into the store-room, and sold at 5s. or 6s. a qr. more, and a return then made of it. In opposition to the view of Mr. Trethewey, he thought this was more a farmer's grievance than a landlord's. The Tithe Commutation Act was a very clever piece of legislation, but its working was not satisfactory as regarded the averages. The landlord was perfectly safe under

the present system. He had only to go to the incoming tenant, and say, "You must take care the tithes are paid." He regretted that Mr. Trethewey should have stated that farmers were not to be trusted to make the returns: for his own part he thought them quite as trustworthy as the merchants.

Mr. TRETHEWEY denied that he had said so. What he had said was, that the farmers, being interested, were not the proper parties to make the returns.

Mr. J. WOOD (Ockley, Hursstpierpont, Sussex) did think it a scandal that an Act of Parliament should have been passed for obtaining the price of the corn grown in this country, and that the matter should have fallen into its present position. Considering the enormous extent to which corn was sold, it was the duty of the Legislature to take care that the Act worked properly. He thought there should be a double return—from the grower and from the buyer—and that there should be a proper officer to check the one against the other. As to the question whether it would be quite just and fair for corn consumed at home to enter into the returns, he did not think that that could be done. If they had returns from the grower and the buyer, they would have a very close approximation to the truth. If there could be an inquiry into the subject before the House of Commons, he was sure that the law would no longer be allowed to remain as it stood (cheers).

Mr. H. CORBET said, in the course of a week or two a member of the House of Commons, Mr. Caird, would bring forward a motion on the subject of agricultural statistics. He did not know whether or not the meeting were aware that they had been discussing agricultural statistics for the last hour. The last time they discussed this question of corn returns there, it was in connection with agricultural statistics, and if they came to analyze the discussion of that evening they would find that it went very much in the same strain. One of the difficulties, so far as he could understand Mr. Chandler's paper and the observations of the gentlemen who followed him, was this—that a great deal of inferior corn, that is, corn that was consumed at home, was never returned at all; and that perhaps the chief remedy for that would be for the legislature to require in so many words a wholesale return of all the corn grown. If they were to go before the Board of Trade on this subject to-morrow, the answer would be, "We have been trying for years to get agricultural statistics, to obtain a full return of all the corn grown in the country, but hitherto we have not been able to succeed." When the object was put before farmers in the form of agricultural statistics, they said "We could not have anything so inquisitorial, we will not have any policemen, we will not fill up any papers, or make any returns; but if you will be kind enough to put the thing in the form of corn averages, then we can understand you." Now, it struck him that if they went to the fundamental principle of what Mr. Chandler had been advocating, what it came to was simply agricultural statistics. They might differ a little: for instance, some gentlemen thought that inferior corn should not be returned, and others that it should; but he believed a majority of the speeches that evening were in favour of all corn being returned in some way or other. So far as he understood, too, the prevalent feeling was that the producer of corn should be to a great extent the instrument of making the return.

Mr. CLAYDEN: The Government asked for prospective returns.

Mr. CORBET: Yes! but they would be very glad to obtain a return of every bushel of corn that was grown. Was the Club prepared to declare itself in favour of agricultural statistics? He had frequently observed that when that expression was used farmers immediately fired up; but to his

mind it certainly appeared that by the experience of that evening the words "agricultural statistics" and "corn returns" meant very much the same thing.

The CHAIRMAN said he did not think they had exactly been discussing agricultural statistics. What they wanted was correct returns, not of all the corn grown, but of all the corn sold. In his own locality, so far as he could judge from what he had seen of the different markets which he attended, a corn-buyer or factor seldom or ever made a return; it was the millers who made the returns. It had been observed that foreign corn did not come at all into connection with the tithe averages. Now, he fancied that it did. They all knew that a large proportion of the Danzic wheat

was better than wheat of English production, and millers were often led to buy such corn, in order to make up a superior quality of flour. He knew that large millers were in the habit of getting hold of first-rate qualities of foreign corn for such purposes; and if they were bound by law to make a return of all that they bought, they must return the foreign corn which they bought, as well as corn of English growth.

Mr. CHANDLER then replied.

On the motion of Mr. H. Tretlowy, seconded by Mr. T. Owen, thanks were voted to Mr. Chandler for his introduction.

On the motion of Mr. Thomas, seconded by Mr. Stelton, thanks were subsequently accorded to the Chairman, and this terminated the proceedings.

FARM LEASES.

The last meeting of the spring session of the Winfrith Farmers' Club was held on Wednesday, April 20, at the Black Bear Inn, Wool. Mr. J. Damsen was in the chair, and Mr. T. H. Saunders in the vice-chair. There was a good attendance of members, and the subject was one calculated to bring them together, being on "Farm Leases."

Mr. W. C. LAOBY, of Wareham, said: Mr. Chairman, Mr. Deputy, and Gentlemen: I appear before you this evening as a tenant farmer and member of this club to introduce a subject for your discussion, a subject I believe to be of great importance both to the tenant farmer and his landlord, as well as to the country at large. Upon reference to your card you will see it printed "On Leases; but your secretary has since prefixed the word "Farm." When I accepted your invitation to introduce this subject, I intended, as I do now, to confine myself to "Farm Leases," for no other class of persons than farmers would think of investing money upon other people's property without a secure holding for such a term as would give them a prospect of repayment with interest. You know it has been stated—for we have heard it so stated in this room by a gentleman who takes a great interest in all our doings here (Mr. Calcraft)—that every man who grows two blades of grass where one only used to grow does a good to his fellow-man and his country; and I feel well assured, if ever it should become the general custom in this, as well as in other counties, for land to be held by lease, it will assist very materially the increased growth of grass, corn, and every other description of farm produce. Now, sir, we are all aware that the custom in this county—and I believe I am right in saying in many counties—is to hold as tenant-at-will. This custom not only exists now, but has existed for very many years; and I think it but justice to the landlords to say that, although this custom (which I believe to be a one-sided one, or, at any rate, much more favourable to the landlord than to the tenant) has lasted so long, it is one that has been rarely, if ever, abused in this county, and barely enough to prove the exception to the general rule. Now, it may be said, if this be so, why want any change? Why not trust to your landlords the same as you have done heretofore? And my answer is, that the alterations which have taken place, whether with regard to the corn laws, the introduction of artificial manures, the increased amount of capital required to manage a farm to advantage, or the improved knowledge required by the farmer to use such increased capital to advantage by expending it upon keeping a larger quantity of stock and the purchase of the best artificial manures, and to apply the same in the right place, all require that the farmer of the present day should be to some extent a different man, or, at least, that he should have more money to expend upon every acre of the land he occupies than was required in the last century. Then, sir, if this be so, I contend that he is entitled to a lease to secure him in his holding; and that landlord will be a wise as well as a good man who, having such tenants, grant to them such leases that they may feel secure in their holding, and thus be encouraged to expect that, in investing all the capital they can command, they will have a certain number of years to hope at least to get it back again, and, in the mean time, to support their family. It was, I believe, the custom of the late Lord Leicester, then Mr. Coke

(called by some the father of agriculture—a gentleman who did much to encourage the improvement in agriculture), to grant leases for twenty-one years, and, with the lease, to give his tenant the advice that he should get all the money he possibly could together, and expend it upon the land the first seven years, get it back the next seven, and do all the good he could for himself during the last seven. Now, this is what I believe to be the right thing; and I hope to see the landlords in this county grant such leases, and, if they please, give such advice. The result would, I believe, be that more would be made of the land, and thus the proprietor would, without any loss to himself, be adding to the profit of his tenant, and doing a general good, as well as improving his estate. The occupier, through the certainty of tenure, would be safe in the expenditure of his capital, and, as I believe, in the return for every extra shilling expended during his term, and with good interest, much more corn would in time be grown to the acre, and thus our country enriched. Now, sir, I believe this has all been tested in the county of Norfolk, and the result has been most satisfactory to all parties. The late Earl of Leicester, when Mr. Coke (the gentleman to whom I have referred), granted leases, for twenty-one years, of land before worth, I believe, 6s. per acre. These farms, containing about 60,000 acres, I have lately been told, now let at 20s. per acre; and the farmers are all doing well—much, very much better now than when the land let at 5s. per acre. I have no doubt so good a landlord expended very large sums of money upon the farm buildings to assist the farmer to husband and make the most of all manure by putting shoots round such buildings, and in many cases, I believe, covering in the entire yard, so that the richness of the manure should not be wasted. I have heard that the tenants are afraid to put more than six putt loads of such stuff to the acre. I know (and you all know) that, after large sums have been expended in our yards by the use of oilcake, barley-meal, and other feeding stuffs, that twenty-five loads to the acre will not injure the land we occupy or damage the crop. The duration of the lease is a matter of great importance: it should not be for too short a time. Seven years is much too short; indeed, fourteen is not sufficient; twenty-one is far preferable to either. I do not say that I expect leases to come into operation as a rule immediately, but I believe if this matter be talked about we shall find some (and I hope very many) good landlords who will take the matter into their serious consideration; and if they do—as I think they will—see that the granting of leases will tend to do the good I have so imperfectly set forth, there is little doubt in my mind but some will make a start in the right direction. Now, sir, having stated thus much as to the granting of leases and the benefit likely to be derived thereby, I think it right to say a few words as to what such leases should and should not contain. They should, of course, provide for the due payment of the rent and taxes, carting of materials for new and repair old buildings; that no stranger be let in as tenant, either by operation of law or otherwise, without the consent of the landlord; the tenant not to break up pasture land without consent. Two other covenants—and they, I think, material ones—should be added: the first, that the tenant should cultivate, manure, and

manage the farm and lands in a fair and husbandlike manner, and leave the same in such a state upon being paid for all unexhausted manures and lasting improvements, according to some good and improved custom; the other, that the landlord should keep the farm buildings and cottages (of which there should be sufficient upon every farm and let with it) in such a state of repair as to enable the tenant to make the most of the estate. In no case do I know of a tenant farmer doing repairs. It is the custom in this county, I believe, generally (of course, there may be some exceptions) for the landlord to do all the repairs, the tenant doing all carriage. In some cases, the landlord finds rough timber for gates, &c., and the tenant pays a portion of the labour; in others, gates and posts are found by the landlord at a fixed price—about 7s. a-set; and I think this a preferable mode, as he does away with annual bills; and the landlord or his agent acts wisely when he follows the old adage, “a stitch in time saves nine.” I hope some day to see the landlords striving as much one against the other to have the best buildings upon their estates as we the tenant farmers strive to take first prize for a general root crop. To meet certain circumstances, a few more short specifications may be required. Now, sir, having stated some of the things to be contained in leases, others, such as the following, may, I think, with advantage be left out—such as folding sheep on a particular field in fine or wet weather: if fine, good would result, but if wet, on many lands the treading would do quite as much injury as the manure would do good, and be a serious injury to the flock; not to tread pasture land in wet weather, and to spread ant and mole-hills; to feed certain portions of the farm with sheep, and at certain times only; to spring-feed clovers and water-meadows, and not to mow the same; not to plant potatoes; not to rent another farm, or to keep a certain number of sheep only at one, and a certain number only at another part of the year: all these should, I think, be left to the tenant, who ought not to be thus restricted. At the risk of being thought tedious, I must name one or two more covenants which I have seen in leases, that will cause you to wonder how they could have been put upon parchment or paper—viz., one that the tenant, during the last year of the term, should not keep more stock upon his farm than heretofore. [Vice-Chairman: Never heard of such a thing.] I find in a lease, granted no longer ago than September, 1843, by a lawyer, a covenant where the tenant is prohibited from paring and burning the headlands, banks, roadways, and other waste part of the lands; and then comes a recital, that whereas divers pestilent and iniquitous attempts have of late been made to introduce into Parliament new laws for abrogating, subverting, or altering existing contracts, or for creating or substituting new contracts or rights or rules between landlord and tenant, and it is possible that such or the like or some other matters may be again attempted which the now contracting parties never agreed to, certain attorneys were then appointed who were, in case of any act of Parliament, as to tenant-right, passing, to release any benefit that the law might confer upon the tenant. Now, I think these are covenants and stipulations injurious to leases; and, if such are to continue, perhaps we should all be better off without them. One covenant most frequently inserted in leases I have omitted, viz., that with regard to game. If not reserved, it is, as you all know, the property of the tenant; and I think if the law as it stands were left alone, and the tenant enjoyed the right, or if a joint right were reserved to landlord and tenant, the former would have as good, if not better sport, when he wished to shoot over his estate: no cost for keepers, and no unpleasantness between him and his tenant as to damage done to crops, &c. This covenant must of necessity be inserted or omitted, according to circumstances. If the tenant enjoyed the privilege of shooting over his farm it would be worth more rent; and I believe most farmers would prefer renting the shooting with their farm, and be willing to pay a fair rent for it, in preference to its being let to a stranger, as is sometimes the case. A clause for reference, in case of dispute, might be added with advantage as a means of preventing litigation. The object of such leases should be to give the tenant the absolute and unrestricted control over the land, and to secure good cultivation during the whole of the term granted, and render it the interest of the occupier to farm

as high during the last two, as in any preceding year; and if such leases are not to be granted, it will be necessary to fall back on the system of tenant-right; and, whilst laying down a system for the cultivation during the last two years, the tenant should at the same time be secured a fair repayment for his unexhausted improvements; and then the Lincolnshire system can be rendered available. It is now the practice of many valuers in Hampshire to allow the out-going tenant one-half the value of the oilcake expended on the land during the year of the tenancy; and, if judiciously expended, it is not too much. The usual allowances in the north of Lincolnshire to outgoing tenants for unexhausted improvements are as follows:—Bone dust: This is considered to last for three years; and a tenant, quitting in the spring of 1861, receives, therefore, two-thirds of the cost of what he put on in 1860 (one-third being supposed to be exhausted by his turnip crop), and one-third of what he put on in 1859, of which he has had the benefit of the other two-thirds in the crops of that year and of 1860. Precisely the same principle is adopted in the following improvements, the only difference being the number of years which each is assumed to last: Marl or chalk, seven years; lime, five years; clay, put on sandy land, four years—on some estates, seven, which is probably a fairer allowance; draining with tiles or stone, when the tenant pays the whole cost, seven years. This is, however, now a rare case, the usual practice being for the landlord to pay the expense, and charge the tenant interest upon the outlay, or find the tiles. In the latter case, the tenant has generally no allowance for putting them in if he has had a crop off the land, though he certainly ought to have a proportion of the cost, as it must often happen that the first crop will not pay for the labour of draining. It would be probably right to put this on the same footing as bones. In addition to these allowances, a fresh one for oilcake given to stock has been established on Lord Yarborough's estate. The allowance is based on the assumption that the manure is improved to the extent of one-half the value of the oilcake consumed; but, to get a fair average as to both quantity and price, it is made to extend over the last two years, and the allowance is two-sixths of the cake used in the last year and one-sixth of that used in the previous one, making together half a year's consumption. Although the system of tenant-right has operated very well in Lincolnshire under a liberal and wealthy landlord, and has rendered the lease in a measure unnecessary, yet, taking the country at large, there cannot be a doubt that the plan of holding by lease is infinitely preferable, and is the surest promoter of good husbandry. Such leases should be as simple as possible, so that all may understand them. The expense should be borne equally between the landlord and his tenant, and the expense need not exceed to each above 6s. or 7s. a-year upon a term of twenty-one years. I have now done my best to bring this subject before you for your discussion, feeling, as I do, that each member of the club should occasionally introduce a subject; and I sincerely hope that we shall not again see our card at the annual dinner placed before us by our worthy secretary without a gentleman's name to every subject proposed for discussion during the year.

The VICE-CHAIRMAN, in opening the discussion, thanked Mr. Lacey, on behalf of the members of the club, for the able manner in which he had brought the subject before them. It had been well done; and, as far as his experience, which extended over a considerable number of years, went, his views agreed with those of Mr. Lacey. They would tend, if carried out, to place both the tenant and the landlord in a better position than they had been for the last seventy years. If a man was not protected by a lease he had not a sufficient guarantee for the repayment of any outlay, nor was he acting justly to himself or family in relying on a yearly tenancy. He did not mean to infer of the landlords generally of the county that they would take advantage of their tenants, but here and there a landlord might be found who would increase the rent if he saw an improvement in the crops. But those who did so, did not calculate the cost to which the tenant himself had been put to effect such an improvement. A man could not afford to have his rent raised because he had had a good crop. It would be similar to laying a tax on the very capital which the tenant had expended to get such a crop. There were other causes

which called upon a tenant to have a lease—the uncertainty as to the death of the landlord, &c. If a gentleman granted a lease, of course the tenant was not justified in allowing the land to remain in a state of filth, as he might term it. If so be that a man obtained a lease, he would, in a commercial point of view, prefer to spread his capital on his land, instead of letting other people have the use of it. By so doing, he would be acting better for himself and his family, his landlord, and perhaps for the labourer—as it were, a general benefactor. If he had only the farm from year to year, it could not be expected that he would lay out his capital with any degree of spirit. He was in favour of the lease being concise, and so that everyone could understand it. He had seen an agreement (or perhaps they might term it a lease), which had been drawn up on a half-sheet of paper, which had stood the test of years and of a court of law. Some of the leases no ordinary farmer could understand. A liberal landlord deserved a liberal tenant; but, without a lease, no landlord could expect to have his land cultivated to the highest point it was capable. The cultivation of the soil in the present day was far different to that of their fathers. The tenant had not only his rent to pay, but also to buy his artificial manures, and lay out his money for other heavy incidental expenses, taking away all the money without paying extra rent. A good crop was often bought before they had it, and at times they did not get it at all. He hoped all would put their shoulder to the wheel, and he felt that if they did so, it would have a good result. Respecting repairs he was in favour of those to farm buildings being left to the landlord. He would say let the farm at a fair rent, and the landlord keep the farm buildings in proper order. By farm buildings he did not refer to gates and bars. A tenant would for his own sake have an eye to the farm buildings and acquaint his landlord of anything wanting. It was a very great consideration in taking a farm as to the buildings and cottages being in good repair. The landlord should not merely content himself with keeping the buildings in repair, but as the tenant improved his estate so should he improve or increase the buildings. The landlord should follow a good tenant, and even do such little matters which perhaps at the time of making the agreement were not thought of, as it were to keep pace with the tenant. The tenant would, he dare say, not object to find the seed for thatching; and if the landlord was at the expense of putting it on, he (the Vice-Chairman) would then think the tenant would find the largest half.

Mr. J. READER also expressed his thanks to Mr. Lacey for the able manner in which he had introduced the subject. Mr. Lacey had said that the late Lord Leicester, then Mr. Coke, thought proper to grant leases for 21 years, and had benefited the tenant, the landlord, and the labourer. If it was necessary 60 or 70 years ago, when all that was required was simply to plough the land, to grant leases, how much more necessary was it in the present day, when the farmer spent large sums in artificial manures and food, and improved implements, and when the rates and charges had increased in number and amount? Surely the tenant required some additional inducement to lay out more money. If a man had a certain interest for 21 years, it was more than probable that he would do all the good he could for his landlord, his family, and the labourer. They were to a great extent dependent on the labourer, and they must give him a slight interest as well in the farm. Take an interest in the labourer and he will take an interest in you and do his best to serve you. They were all looking forward to the time when steam ploughs would become general; and was it likely a tenant would invest £700 or £800 in the purchase of one without a certain interest in the land for years? They all well knew that if a man bought a steam plough and in six months time or even the next day had to sell it he could not get so much for it by several pounds as he had given. A yearly tenancy did not hold out any inducement to a tenant to lay out his money. They all knew what a little inducement would do. Even with their own club for the root prizes offered, many laid out a great deal more money to get them than the mere money-value of the prizes. By granting a lease, the landlord would be improving his property, and doing a vast amount of good to himself, and it might be to the tenant and labourer. The landlord must go some day with the tenant, or else he could not expect to see steam ploughs and other expensive machinery on the farm. Mr. Reader then made allusion to

the difference between the theoretical and practical landlord, and believed that in the hands of the latter the tenant was safer than in those of the former. He hoped all would give their opinion on the subject, and seek to obtain a guarantee for laying out their money, so that time might be given to recover it, and with perhaps an addition to such outlay.

Mr. BATES (steward to Mr. Weld) thought in many instances leases were beneficial, but not in all. He had known instances where both landlords and tenants had suffered by leases. The landlord might suffer in many ways. Perhaps an application was made by a stranger for the farm; the landlord could only obtain limited information as to the proposed tenant's means, whether he was qualified to cultivate it, or what he intended to do with it. The tenant had it in his power to injure the farm and be an annoyance to the landlord. A landlord could not run away from the farm, but a tenant might. He thought that there was, however, no question but that the tenant should have protection, and if a landlord did not give it he stood in his own light, as he could not expect money to be expended without security. The tenant might be protected, he thought, under a good tenant-right, based upon some fair and equitable principle, and under it a landlord would have as good a chance as under a lease. With respect to game, no reasonable landlord would expect a tenant to keep it to his injury, as if it eat his crops he would not pay his rent. No reasonable tenant would object to keep a fair amount of game for the use of the landlord, if it was reserved to him. There really ought to be some limits to the extent of game that should be kept, and an understanding as to payment for damage committed. He did not agree with Mr. Saunders in thinking that the landlord should do the whole of the repairs. Tenants had different views, and if the landlord had to pay the whole of the cost he would do the repairs in his own way. No doubt the buildings were the farmer's shop, and if he had not a shop he could not produce any work; but he would say, give the tenant a little interest in the buildings, let him pay a share of the labour, and then it would cut both ways. Whether a lease or yearly tenancy, he thought the tenant should contribute his proportion to the repairs, and then the tenant would have an interest in keeping the cost of such repairs as low as possible. If left entirely to the landlord, the tenant might overlook any trifling defect, allow it to go on, and at last discover that, for want of a stitch in time, it would cost nine times as much to repair as it would in the first instance. The tenant should have some small pecuniary interest in the buildings [Mr. Saunders: The lease gives him that.], and by paying a portion of the cost of the repairs they would secure such interest. With respect to the remarks as to the raising of the rent if a good crop were produced, he did not think it would apply as a general rule to landlords. It was their interest to retain good tenants, as every new tenant that came upon a farm generally required something to be done. A disagreeable landlord was soon known, and the tenants became distrustful. He considered that in many cases leases were beneficial, and he would advocate them under strong circumstances, but not as a general rule. He did not mention that in opposition to the views ably put forth by the preceding speakers, but as he, in common with others, had been invited to give his opinion, he had done so; and from his experience, more especially in the North of England, he had known in many instances leases objectionable both to landlord and tenant.

Mr. READER observed, in reference to Mr. Bates' remarks as to the landlord not being able to ascertain as to the means, &c., of a stranger who might apply for a farm, that to get tenants in the county of Dorset there was no necessity to go out of it, and if the landlord did, he deserved to be taken in. If there was a good tenant-right, with two years' notice to quit at the end of it, it might do good in some cases; but in others even the money that the outgoing tenant might receive under the tenant-right would not compensate him for everything.

Mr. UDALL agreed with the preceding speakers in the substance of their remarks, and while human nature continued in the same state as it then was, he observed that a tenant would expect some security for the money he spent. If every man in the country were honest, there would be no necessity for a police rate or a police constable. It had been said that you should treat an honest man as you would a rogue. No man would buy a large estate without having

the title investigated, and have it properly conveyed to him. He would not feel inclined to pay the purchase-money upon a mere verbal understanding that it was his; and in the same manner the tenant was not asking too much in seeking a security for the money which he contemplated spending on another's property. There might be a difficulty in the matter, but was there not a difficulty in everything? They were all agreed on one point, that for the advantageous development of the land it was necessary that the tenant should have some security. Then came the question, how was it to be done? could it be effected best by leases, so that a thorough and good cultivation of the land might be carried out? If Mr. Bates could lay down a system of tenant-right which would give the benefit of the capital to the fullest extent to the tenant, and at the same time ample security to the landlord, he would say, throw overboard the leases, and let us have a tenant-right. But in tenant-right he felt there was something which did not quite meet the case. Three removes, it had been remarked, were as bad as a fire. But little good was often gained by shifting, and it was to the interest of the tenant to continue in one place, and endeavour to cultivate the land to its highest possible state. But could that be effected if a landlord could say to his tenant, "Turn out next year; I'll pay you for everything." There was something, however, which a landlord could not pay for—the severance of close ties of relationship, the loss of a circle of friends, &c., were often more to the tenant than the amount of money he would receive for compensation. For his own part, he might say, that capital would not be invested by prudent men without security. The interests of the landlord and the tenant were identical; and he was not in favour of having a one-sided lease, either one way or other. In the lease a clause might be inserted, giving the landlord compensation for bad management on the part of the tenant; and under the present law the landlord had the power to come in and sweep off everything, to the detriment of the other creditors in case of non-payment of rent, and it also gave him the power to take possession. He would not think of asking his landlord to give him a lease without a clause for damages for bad farming. He would prefer a lease for the certainty and permanency of occupation, and which would bring out good farming; but as to the latter, he did not care whether it was effected by lease or tenant-right. With one or two exceptions, they might take the word of the landlords in Dorset as their bonds, and he should be most sorry to see destroyed that kindness of feeling and fine old courtesy which had existed for years between ninety-nine landlords and tenants out of a hundred. If a tenant paid £50 in the way of trade, he generally took a receipt, and farmers required that their operations should be in keeping with commercial transactions.

Mr. BATES here remarked that he hoped he had not conveyed the impression that the tenant should have no protection (No, no). Whether lease or tenant-right, he would say, let the tenant have full and ample security for what he expended on the land.

The CHAIRMAN said he rose with great pleasure to propose a vote of thanks to the gentleman who in an unexceptionable manner had introduced the subject. The opening address and the discussion that had followed had been conducted in such a manner that no landlord could take offence. What objection could there be to a lease with a good tenant-right at the end of it? Under the old style of leases for 7, 14, or 21 years, two years before the expiration preparations were oftentimes made for leaving, because perhaps there was a doubt as to making fresh arrangements with the landlord. With tenant-right he did not see why the land should not be as well farmed in the last year as in the early portion of the term. He agreed with Mr. Bates that the tenant should have some stake in the buildings, and he had seen instances showing the ill effects of the want of such an interest. He believed that it had always been the aim of that Club in their discussions to steer clear of giving offence to anyone, and he was happy to say they had succeeded. Such would always be their

desire, and he hoped they would ever conduct their meetings without reproach from anyone. He begged to propose a vote of thanks to Mr. Lacey.

The VICE-CHAIRMAN remarked that he was still in favour of the landlord keeping the buildings in repair. The interest of the tenant in their being in proper order for use would always be sufficient for the purpose; besides, if a tenant had to contribute he might not always see repairs which required to be done.

Mr. MARKE seconded the vote of thanks to Mr. Lacey.

Mr. LACY, in responding, said, though he was not a very young man, yet it was the first time he had attempted to introduce a subject. It was highly gratifying to him to find that he had done so to their satisfaction, and to hear the remarks which had fallen from other gentlemen. There were three courses open to them as to renting land: first, to go on in the present unsatisfactory manner; second, to have a lease; and third, to have a good tenant-right, with a long notice to quit. Leases he thought preferable to any other tenure. He was pleased to hear that Mr. Bates was in favour of the tenant having a fair return for his outlay; and, as it was, as Mr. Bates had stated, not practicable in all cases to grant leases, as, for instance, where the land was only held for life, or from other circumstances, it would not be advisable to do so. If a lease could not be obtained, let the tenant have a tenant-right; but under whatever mode he held the land, do not let him feel that he must exhaust the land to get back the value of that which he had expended—a course not only injurious to the landlord, but to the incoming tenant; and the outgoing tenant might in his next holding find a farm so treated, which would be to his disadvantage. With respect to repairs, he was pleased to hear the remarks by Mr. Bates, but he did not agree with the whole of them. He could not help thinking but that the landlord should do them. It was only an opinion, and others might think different. After alluding to some remarks of Mr. Udall as to the great destruction often committed to crops by the land being overstocked with rabbits, Mr. Lacey referred to some landlords whom he had heard did not act in that liberal manner which nearly the whole of Dorset did in respect to the injury occasioned to the tenant by rabbits. He did not think a tenant-right would help a tenant in that respect, but a lease might. He again thanked them, thought it could have been done much better by another person (No, no), and was pleased with the attention paid him, and the discussion it had produced.

THE DECLINE OF TILLAGE AND POPULATION IN IRELAND.—The Registrar-General for Ireland reports that there was a decrease of 94,980 acres in the extent of land under tillage in Ireland in 1863, compared with 1862. The yield of last harvest, in consequence of the season, is estimated at 1,893,541 quarters more than in 1862. The produce of wheat was 154,858 quarters more than in 1862; oats, 1,646,271 quarters more; barley, 96,696 quarters more; potatoes, 1,297,547 tons more; turnips, 300,990 tons more; cabbage, 65,967 tons more; flax, 18,368 tons more; mangold-wurzel and hay proved exceptions. The produce of wheat, oats, barley, bere, and rye, in 1863, is estimated at 10,554,667 quarters; and of potatoes, turnips, mangold-wurzel, cabbage, flax, and hay, 10,961,934 tons. The quantity of most of these crops is far below what it was sixteen years ago, but hay has increased, and flax more than doubled. These estimates are obtained through enumerators, who procure the information from intelligent landowners or other competent persons; and the estimates are revised by the boards of guardians. The emigration of persons stating that it was not their intention to return rose from 72,730, in 1862, to 117,620, in 1863. Nearly half the emigration was from Munster, though Munster has not very much more than a fourth of the population of Ireland. In age, two-thirds of the emigrants were between fifteen and thirty-five.

HOW TO EDUCATE YOUNG FARMERS.

BY A PRACTICAL FARMER.

The agricultural public are much indebted to Mr. Holland for so prominently bringing the subject of "Agricultural Education" forward for discussion. It will by no means be confined to the Royal Agricultural Society's Rooms, but the whole agricultural press will take it up; the country societies will respond to it; the farmers' clubs will debate it; the market ordinaries "will have their say" upon it; farmers' families will intently canvas it; it will find its way to college councils, to public schools, to private schools; it will excite the favourable attention of the whole class of agricultural progressionists; it will lead to renewed exertion to provide for a manifest want, *i. e.*, the better education of young farmers.

The great question for discussion is—the way this is to be done. How are young farmers to be educated? In the first place, they must have a good, if not a liberal, but sound English education; not necessarily a classical education; that is going a step too far; and experience teaches us that a student on whom is engrafted the higher branches of education generally makes, ultimately, a sorry farmer. No; his education should in some sense be in accordance with his future prospects; it should fit him more eminently for his business; not imbue him with such a love, such a hankering after the higher branches of knowledge as to unfit him for the minor and petty details of farm business. In this lies the difficulty and danger with youths of powerful and inquisitive minds. If such minds are made to taste and to feel the true value, the sweets and elevating stores of knowledge, the whole world cannot restrain them in the pursuit. Young men who may be blessed with such minds ought to seek more congenial and more ennobling employments than such as pertains to the business of a farmer, however intelligently it may be conducted. There are so many common and ordinary matters, may even such petty and uninteresting details connected with farming, that elevated minds cannot be so lowered as to fully comprehend and carry them out effectually. The minds of men are as variable as their bodies. There must be a suitability and an adaptation of mind, to be successful in any department either of business or profession. Hence young farmers ought to be especially careful in adopting and in choosing to follow their own business. If they are qualified for it, no effort can be too great on their part to acquire all that can be known, likely to lead to the most profitable conduct of it.

Well, where and how are they to acquire this knowledge?—this business knowledge? The only institution we have, which professedly teaches this knowledge, is the College at Cirencester. It is a noble institution in its way, and does a great deal of good. But all our young farmers cannot go there; to some its terms would be expensive; to others time would be an object; then the appliances for culture and management there are so different to what most farmers could command, that its conduct could be carried out by scarcely any of its students. Still, the fundamental principles of agriculture are there taught, and this would suffice for very many other establishments. The best principles and practice of modern agriculture might and ought to be taught in our colleges and public schools to such pupils

who might desire it. At Cirencester College a truly good education of a general character is to be obtained in conjunction with sound, practical, and scientific agricultural instruction. It is unquestionably the best school we have had for our higher class of young farmers; it is precisely what is wanted. But there is a very large class of young farmers in the middle ranks of life, who require similar instruction, but who cannot afford to pay the terms established at Cirencester; neither do they require to be so thoroughly indoctrinated in chemistry, botany, geology, &c., as is there considered imperatively necessary. A knowledge of first principles would to them suffice. There are plenty of professional men, who would analyze soils, or cake, or manures far better and more satisfactorily than themselves. The great thing for them is to know that such examinations are useful and desirable. How then are these "middle class" farmers to be educated? I answer—in very many ways. The question requires to be put in every circle: the subject must be continually agitated: the necessity must be shown. It is impossible to define what our modern agriculture will achieve. Every one knows it has already done much; many, however, still think we are only on the threshold—that much more remains to be done than has yet been accomplished. Take steam culture: how little is known of its power and results, or the true and proper application of it! Take farm crops: how little is known of the value and influence of chemical manures upon them, in reference to rotations of cropping or individual crops! Take the soils we cultivate: how little is known of the value of these manures upon them, or the economical and profitable application of them! Some facts of this kind are astounding; fertility not only being kept up under very heavy cropping, but enhanced greatly, and made capable of producing these crops indefinitely, without material change. Who can tell to what limit soils properly cultivated and manured are to be confined? Then, again, take the management of farm stock: how little is really known as to the correct quantity, and the kind of food best adapted to promote the first profitable progress in our domestic animals; in their rearing; in their general management! Nearly all the food is now left at the discretion of the animal. Some will appropriate more, some less. All managers think it right to supply enough: few consider if it is wasted or misapplied. Be it borne in mind that nearly all our improvements in our breeds of cattle were effected under the proof of food consumed and improvement noted. The late Mr. Bates and many others administered food by weight to their cattle, and thus proved which were most profitable. This is one of the important things yet to be known: the best management and the best applications of food—of food in all its endless varieties. These, and many, many others, that might be suggested, are matters of study for our next race of farmers. The question is, I again repeat, How are they to learn all these things? My impression is, that we have many ways already open, if sufficient influence could be brought to bear upon them. I would have agriculture taught in all our colleges—in all our public schools. I would institute college scholarships and prizes for agricultural students. I would suggest that our Royal Agricultural Society should institute a series of prizes, to be competed for annually, and such prizes should

be open for competition to all students of agriculture not in business for themselves; and in this category I would include, not only the above colleges and public schools, but all private schools; all farmers' establishments where agricultural pupils are taught, and all young farmers resident with their families, or otherwise studying agriculture; in fact, all young men studying agriculture with a view to practise it. In addition to these inducements to young farmers generally, I would suggest the establishment of proprietary schools in suitable localities, where, amongst other studies, agriculture should have a prominent place. I would also suggest that farmers who take in agricultural pupils should connect themselves with, and give evidence of their competency to, such colleges, public

schools, the Royal Agricultural Society of England's Council, or otherwise, as they may deem proper; and that the friends of young men desiring agricultural instruction should solicit a recommendation from the authorities of these various institutions. One great point with me is, that no agricultural education can be complete without residence on some well-managed farm, so as to see everything practically carried out. This is the way to gain experience in the many phases of every-day management and the petty details continually occurring—the contrivance of the daily work, the direction of the labourers, the distribution of the stock, the state of the pastures, the state of stock, the condition of the crops; in fact, the right thing to do, and the right time and place.

THE CULTURE OF TOBACCO.

The Americans have found out by this time that we are less dependent on them for cotton than they had originally supposed. The demand has gone forth with the added stimulus of high prices, and dozens of new countries are competing to supply the British manufacturers. If our total receipts have dwindled to one-half of what they were a few years ago—and we get but six million hundredweight in place of twelve—the effort making in every quarter will soon make us independent of the North American supply, or at all events greatly bring down prices. Irrespective of cotton from the Southern States, Egypt has doubled her supplies to us, India has given us an extra half million hundredweight, one million more have come in this year from new quarters, whilst Brazil and the River Plate countries, South Africa, and Australia are extending cultivation, and Italy and Algeria are throwing themselves vigorously into the competition.

So also with grain and provisions: we are becoming more independent of transatlantic supplies. With another article of large consumption we shall also ere long be much more independent of America, and that is tobacco. There is scarcely an article so universally consumed by all races and all classes in all parts of the world as tobacco. In this country the consumption goes on increasing year by year. Last year it exceeded 37 million pounds, besides more than half a million pounds of cigars and snuff.

The production of the world has been roughly estimated at 500 million pounds, but this is difficult to arrive at with any accuracy. It is a plant easily grown, and flourishes in the West India Islands, in the Central and South American States, in Northern, Western, and Southern Africa, in many parts of India, Ceylon, and Australia. Even Canada could be made to produce good tobacco, and the climate of Ireland is suited to its culture. It can be grown in nearly all parts of Western and Central Europe, although in many it is strictly prohibited, for fear that its production would interfere with the revenues of Government. Very much could be done to supply the consumers of the United Kingdom with a superior article, if more attention were given to the subject, both by the planters of India and the Colonies.

France is largely cultivating the weed in Algeria; Spain in Cuba and the Philippines, Holland in Java and the East: in short, from the torrid zone to the temperature of the British islands, there is hardly a spot where this universally used article might not be produced. The profits on its growth are enormous, amounting, it is said, even in the most indifferent seasons, to at least one hundred per cent. While we have in the British possessions

in every part of the world every imaginable kind of climate, where tobacco could be produced in great abundance, we have hitherto been almost exclusively dependent upon the United States for the bulk of our supplies. Considering the highly remunerative character of this article, this is surprising. The plant is easy of cultivation, does not require much labour, and might be rendered without difficulty a staple article of export from India, Australia, or the Cape of Good Hope, to say nothing of our West India islands, which will cling pertinaciously to sugar culture. In Australia and New Zealand some increased attention is being given to the culture of tobacco for making sheep-wash; but very little is grown, for home consumption even. Tobacco has been grown in the Cape Colony for many years; but, owing to the fact that farmers manufacture it in the most primitive style, rolling the leaves up rope-fashion, and drying it in the sun, in which state it is called boor's tobacco, it is only used by the farmers themselves and their servants. Lately those who are anxious that the capabilities of the colony should be more fully developed have pointed to the fact that there are isolated instances in several parts of the colony, of farmers producing several kinds of tobacco.

These farmers have proved that the soil is capable of growing every species of the plant in great perfection, and it was felt that some encouragement should be held out to farmers to depart from the orthodox fashion, and turn out the leaf in the Cavendish, or golden-leaf style. At one of the recent agricultural shows in the colony, a Mr. Rauterback produced in the eastern province a hundred pounds weight of tobacco, done up in casks, and looking exceedingly handsome, although a close inspection revealed the fact that much knowledge and experience was yet required for the preparation. The judges unanimously awarded him the first prize of £15; and he has engaged to produce 1,000 pounds weight from his next crop. The plant produces three crops of leaves per annum in the Cape colony; is strong and healthy, and transplants with ease.

The best tobacco soils of Cuba and the Philippines are for the most red soils, containing the reddish-brown oxide of iron; and the quality of the tobacco produced would seem to depend mainly on the state and quantity of the iron in the soil. The best soils contain about 16 per cent. of peroxide of iron, and inferior soils only about six per cent., and in the state of protoxide or black oxide. In Virginia, rich moist soils are selected, inclining to sandy. In Cuba, rich sandy loams are also preferred. The best is grown on the margin of moors, which are periodically overflowed. In Persia, for the Sheraz tobacco,

a dark soil is chosen, but not a red clay. The plant, although comparatively hardy, must be treated as an exotic. It is decidedly an exhausting or impoverishing plant, and requires the richest loam to make it a remunerative crop; as on the one hand, if the land is poor, the yield will be but scanty, and that of a coarse rank nature; whilst on the other, the land being poor at the onset, will be still more reduced so as to be absolutely valueless for a

succession crop. The difference (if there is any) depends on the geographical situation of the place, with respect to its temperature, or on the backwardness or advancement of its seasons, and even on a duration of the same, in which circumstances the planters take advantage of the one for the other. The influence of a burning climate may be modified by choosing the coolest month of the year, whereas the soil cannot be altered without incurring great expense.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY COUNCIL: Wednesday, May 4.—Present: Lord Feversham, President, in the chair; Earl Cathcart, the Earl of Powis, Viscount Eversley, Lord Berners, Lord Chesham, Lord Portman, Lord Tredegar, Lord Walsingham; Sir J. V. B. Johnstone, Bart., M.P.; Sir E. C. Kerrison, Bart., M.P.; Sir Matthew White Ridley, Bart., M.P.; Mr. Acland, Mr. Raymond Barker, Mr. Barthropp, Mr. Bowly, Mr. Bramston, M.P.; Mr. Cantrell, Colonel Challoner, Mr. Clayden, Mr. Dent, M.P.; Mr. Druce, Mr. Brandreth Gibbs, Mr. Holland, M.P.; Mr. Wren Hoskyns, Mr. Hudson, Mr. Humberston, M.P.; Mr. Hutton, Mr. Jonas, Colonel Kingscote, M.P.; Mr. Lawes, Mr. Lawrence, Mr. Milward, Mr. Pain, Mr. Pope, Mr. Randall, Mr. Rigden, Mr. Sanday, Mr. Shuttleworth, Mr. Robert Smith, Mr. Thompson, M.P.; Mr. Torr, Mr. Turner, Mr. Burch Western, Mr. Wells, Professor Wilson, Mr. Frere, Professor Simonds, and Dr. Voelcker.

The following new members were elected:—

Avery, William Howard, Stockton Grange, Salford
Barton, Rev. Joseph, East Leigh, Havant
Barras, James, Cramlington, Northumberland
Bell, William, Cramlington, Northumberland
Berrington, Arthur D., Pant y Goitre, Newport, Monmouthsh.
Blenkinsop, Samuel, Lobley Hill, Gateshead
Bolam, Charles G., Bentinck-ter., Newcastle-on-Tyne
Bolam, William Thos., Bentinck-ter., Newcastle-on-Tyne
Bouverie, Phillip Pleydell, Brymore, Bridgewater
Cochrane, Archibald, Langton Grange, Gainford, Darlington
Coulman, Edward, The Levels, Thorne, Yorkshire
Coven, Joseph, Stella Hall, Blaydon-on-Tyne
Davison, Joseph, Greencroft, Durham
Ethrick, Anthony, North Hylton, Sunderland
Gamon, William, The Green, Thornton-le-Moor, Chester
Garbutt, Cornelius Durham, Gateshead
Haines, John Poole, Dantisbourne House, Cirencester
Hanny, Roberts, Springfield, Ulverston
Henderson, William, Harton, South Shields
Horrell, John, Stevington, Bedford
Lee, John Bunting, Stocksfield Hall, Stocksfield-on-Tyne
Melvain, Henry, jun., 26, Elswick Villas, Newcastle-on-Tyne
Newcombe, Frederick, Ravensworth, Gateshead
Nicholson, George, Winton, Blaydon-on-Tyne
Palmer, Charles Mark, Whitley Park, Newcastle-on-Tyne
Payne, Charles, Newcastle-on-Tyne
Ravensworth, Lord, Ravensworth Castle, Gateshead
Ranger, Josiah, Ashdown Park, East Grinstead
Rayne, Septimus William, Newcastle-on-Tyne
Robson, John, Sunnaside, Newcastle-on-Tyne
Rowlandson, Samuel, Newton Morrell, Darlington
Rose, Christopher, Zeals Green, Mers. Wiltshire
Schneider, Henry Wm., Lightburne House, Ulverston
Thompson, Thos. H., Cavil Head, Acklington
Veitch, Harry James, King's road, Chelsea, London, S.W.
Walker, Richard C., Middlesex Grange, West Hartlepool
Waldy, William, Great Burdon, Darlington
Webster, Samuel, Wadworth Hall, Doncaster
Webb, Lankester, Combe Tannery, Stowmarket
Wilkin, Joseph, Chowden Hall, Gateshead-on-Tyne
Wood, Rowland, Clapton, Thrapston.

Major-General the Hon. A. Nelson Hood was unau-

mously elected a Vice-President of the Society in the room of the late Lord Ashburton, on the nomination Mr. Bramston, M.P., seconded by Colonel Challoner.

FINANCES.—Mr. Bramston, M.P., presented the report of the Committee, from which it appeared that the Secretary's receipts during the past month had been examined by the Committee, and by Messrs. Quilter, Ball, and Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on April 30 was £2,886 6s. 6d.

JOURNAL.—Mr. Thompson, M.P., Chairman, reported the following arrangements for the Weekly Meetings of the Council: Wednesday, May 11, Professor Voelcker will deliver a lecture on the Nutrition of Plants by the Atmosphere; June 8, Professor Simonds on Small-pox in Sheep.

NEWCASTLE MEETING.—Sir Matthew White Ridley, Bart., M.P., reported that the Committee had settled the programme, which would be forwarded to every member of the Society. Arrangements had been entered into with two respectable local tradesmen for an efficient supply of refreshments in the Show-yard. This report was adopted.

COUNTRY MEETING OF 1865.—The report of the Committee appointed to inspect the various sites offered to the Society at Exeter and Plymouth having been read, the Council were favoured by the attendance of the following deputations:

Deputation from Exeter and its neighbourhood.—The Right Worshipful the Mayor of Exeter, the Right Hon. the Earl of Devon, the Right Hon. Lord Clifford, the Right Hon. Lord Poltimore, the Hon. C. Trefusis, M.P., Sir Stafford H. Northcote, Bart., C.B., M.P., Sir John Duckworth, Bart., Sir John Duntze, Bart., R. S. Gard, Esq. (M.P. for Exeter), Colonel Davis, and R. Brembridge, Esq. (M.P.'s for Barnstaple), Henry Hooper, Esq. (Deputy Mayor and the Hon. Treasurer), Wm. Barnes, Esq. (Ex-Mayor, J.P. for Devon), J. H. Helly, Esq. (J.P. for Devon), J. C. M. Stevens, Esq. (J.P. for Devon), J. Daw, Esq., E. Osmould, Esq., Dr. Breat (Chairman of the Exeter and Exmouth Railway Company), R. M. Daw, and Henry Drew (Hon. Secs. to the Local Committee).

Plymouth Deputation.—The Earl of St. Germans, Viscount Falmouth, Lord Churston (the Mayor of Plymouth), the Solicitor-General and Walter Morrison, Esq. (M.P.'s for Plymouth), the Mayor of Devonport, Sir Arthur Buller and Wm. Ferrand, Esq. (M.P.'s for Devonport), T. J. A. Roberts, Esq., N. Kendall, Esq., John St. Aubyn, Esq., and Richard Davey, Esq. (M.P.'s for Cornwall), Sir John Trelawny, Bart., and Arthur Russell, Esq. (M.P.'s for Tavistock), Sir Massey Lopes, Bart. (M.P., Chairman of Local Committee), John Tremayne, Esq., and Wm. Derry, Esq. (Vice-chairmen), Edward Archer, Esq. (Local Committee), T. Woolcombe (Chairman South Devon—Vice-chairman Cornwall Railway), Henry Brown (Director of ditto), John Wm. Woolcombe (Secretary of Local Committee).

These gentlemen having communicated to the Council the fullest local information connected with their respective districts, and having answered satisfactorily the inquiries made of them by the Council, the President expressed to them the best thanks of himself and the Council.

for their kindness in having attended the meeting that day, and for the deep interest they had evinced in promoting the objects of the Society.

The deputations having withdrawn, the Council proceeded to the consideration of the particular locality best suited, under all circumstances, for holding the Country Meeting next year; and after some discussion of the respective advantages of each position to which their attention had been called, it was decided in favour of Plymouth by 24 votes to 10.

HOUSE LIST.—Agreeably with the bye-laws the Council arranged by ballot the following election list to be recommended by them for adoption at the ensuing General Meeting on the 23rd instant:

ATTENDANCES (FROM THE RISING OF THE BATTERSEA MEETING, IN 1862, TO THE PRESENT TIME).

Names.	Monthly Councils.	Special Councils.	Weekly Councils.	Committees.	
	Total, 16	Total, 3	Total, 19	No. of Meetings.	Attendances.
Amos, Charles Edwards, 5, Cedars Road, Clapham Common, Surrey	4	2	4	7	4
Arkwright, J. Hungerford, Hampton Court, Leominster, Herefordshire	2	2	2	19	6
Barthropp, Nathaniel George, Hacheston, Wickham Market, Suffolk	2	2	2	2	2
Bowly, Edward, Stiddington House, Cirencester, Gloucestershire	6	0	0	0	0
Cheaham, Lord, Latimer, Chesham, Bucks	12	2	6	23	16
Druce, Joseph, Eynsham, Oxford	11	2	1	2	1
Fortescue, Earl, Castle Hill, Southmolton, Devon	—	—	—	—	—
Gibbs, B. T. Brandreth, Halfmoon-street, Piccadilly, London, W.	16	3	3	46	27
Holland, Edward, M.P., Dumbleton Hall, Evesham, Worcestershire	11	2	11	43	22
Hoskyns, Chandos Wren, Harewood, Eves, Herefordshire	2	0	2	47	22
Hutton, William, Gate Burton, Gainsborough, Lincolnshire	4	0	0	0	0
Jones, Samuel, Christall Grange, Saffron Walden, Essex	9	2	2	3	1
Kerrison, Sir Edward, Bart., M.P., Brome Hall, Soles, Suffolk	2	1	12	16	6
Laves, John Bennett, Rothamsted, St. Alban's, Herts	7	0	1	5	1
Lawrence, Charles, Cirencester, Gloucestershire	6	1	0	0	0
Leigh, Lord, Stoneleigh Abbey, Warwickshire	1	0	0	12	0
Macdonald, Sir Archibald K., Bart., Woolmer Lodge, Liphook, Hants	11	2	4	23	7
Randell, Charles, Chadbury, Evesham, Worcestershire	14	1	1	22	14
Sanday, William, Holmepeirre-pont, Notts	6	1	0	0	0
Shrewsbury and Talbot, Earl of, Ingestre Hall, Stafford	—	—	—	—	—
Shuttleworth, Joseph, Harts holme Hall, Lincoln	12	1	0	26	13
Smith, Robert, Emmett's Grange, Southmolton, Devon	4	1	1	3	0
Towneley, Lieut.-Col., Charles, Towneley Park, Blackburn, Lancashire	3	0	0	0	0
Tredegar, Lord, Tredegar, Newport, Monmouthshire	7	1	2	0	0
Wells, William, Holmewood, Peterborough, Northamptonshire	10	0	2	21	5

Lord WALSINGHAM having moved that the Society hold their Country Meeting for 1866 in the district comprising the counties of Cambridgeshire, Essex, Hertfordshire, Huntingdonshire, Norfolk, and Suffolk, it was seconded by Mr. Bramston, M.P., and adopted.

Mr. CLAYDEN having moved that in the opinion of the

Council it is undesirable that the Consulting Engineer of the Society should have business transactions with the competing firms, the motion was seconded by Mr. Druce; but an amendment having been moved by Mr. Pain, that "the Council has every confidence in the Consulting Engineers, and sees no reason to alter the present arrangement," a division was taken, when three votes were given for the original motion, and thirty-four for the amendment.

The Council then adjourned to their weekly meeting on the 11th May.

At the meeting held in the rooms of the Society in Hanover-square, on Wednesday, May 11, Professor Voelcker read a lecture on "The Atmospheric Nutrition of Plants." Mr. Raymond Barker presided.

Professor VOELCKER commenced by saying:—"Theoretical inquiries like those which had been made from time to time in the nutrition of plants, at first sight might appear of very little practical interest; but, on looking closer into the matter, it would be found that questions of vital importance to the farmer depended very much upon the theoretical views entertained with respect to such theoretical inquiries. He would remind them of the controversy that had been revived within the last year or two with respect to the humus theory, under the new name of the vegetable mould theory; and serious apprehensions were entertained by many intelligent educated people that, by degrees, we might relapse into the condition in which it would be difficult to grow remunerative crops on the soils of England. Those apprehensions could not possibly have been entertained if correct views existed as to the way in which plants took up their food. The old humus theory has been successfully annihilated; for, after Liebig's forcible writings in exposing its fallacy, it was impossible that that theory could be maintained. Yet it was strange that, up to this day, the readers of respectable journals should be entertained with lengthy papers on the vegetable mould theory, as it had been called—papers which were little instructive to those who had not any precise views on the subject, and anything but entertaining to those who were acquainted with the recent progress of scientific research as bearing upon the process of the nutrition of plants. With these preliminary remarks, he wished, with reference to the subject of his lecture, to mention that there was nothing he could say of the atmospheric nutrition of plants that was original, or that was of very recent date; for he confessed, at the very outset, that within the last five or six years no very striking discoveries had been made which bore upon the subject. He had therefore, in a great measure, rather to systematise previous knowledge than to make any addition either from his own investigations or from those of others. But, though they had not any material additions to their knowledge, yet that knowledge had become more definite and positive, so that they could with greater certainty speak on matters of which they had formerly but indistinct ideas. It would be necessary to allude briefly to the composition of the atmosphere, as they were well aware it was a mechanical mixture, chiefly of two gases—oxygen constituting about 21 parts in round numbers, and nitrogen 79. Mixed with these two gases were certain small proportions of carbonic acid, ammonia, nitric acid, and invariably there was also present water in the shape of watery vapour. It was interesting to notice that

the most apparent constituent of the atmosphere (nitrogen) did not take any direct part in the nutrition of plants, but that it was precisely those small quantities of matters that had been overlooked for a long time—ammonia and nitric acid—that played the most important part in that process. How true was it that what was most important to the very existence of many beings was often overlooked, whilst what was most striking to the senses was not of that practical importance which at first sight it might appear to be! Nitrogen, then, notwithstanding some recent experiments that had been made in France, by M. Ville, to show that nitrogen was assimilated in small quantities by some plants, it had been clearly proved had no direct influence in the nutrition of plants. They had most valuable experience in these matters, in the experiments of M. Boussingault, in France, and of Messrs. Lawes and Gilbert, in England; and it appeared most decisively, from these experiments, that nitrogen, as an element of the atmosphere, was not assimilated. Oxygen, the other great constituent of the air had more an indirect influence in the nutrition of plants than a direct one. The plants restored oxygen to the atmosphere. They kept up the balance of oxygen which it was so necessary to restore, inasmuch as animals continually took up oxygen from the air, which they required for the support of respiration. As was well known, plants restored this oxygen from the carbonic acid which, through the medium of their leaves, they absorbed during the daytime. He need not dwell upon this part of his subject, for they had now abundant proof that it was chiefly the carbonic acid of the atmosphere that supplied the carbon of the plants, or, in other words, that supplied the great bulk of all vegetation. It was calculated that at least three-fourths of all the carbonizing plants—or, of all plants—was derived from carbon. During the daytime, the absorption took place continuously; and, no sooner had the leaves absorbed carbonic acid than they set about the work of destroying its form, assimilating the carbon, manufacturing it into starch, gum, sugar, and other combinations found in all vegetable productions, throwing off at the same time the oxygen, and thus restoring that balance which became continually disturbed by the removal of the oxygen by animals. It was supposed that the decomposition took place by direct sun light; but that was a mistake. The reflected rays and diffused light were capable of effecting this decomposition of carbonic acid as well as direct light, so that direct sunshine was not necessary that plants might grow and assimilate carbon. A question which naturally arose at once in the mind of every intelligent observer of the fact that carbonic acid was the chief source from whence plants derived their carbon was this—“Is the carbonic acid in the atmosphere sufficient to meet all the requirements not only of plants growing in an uncultivated state, but of plants growing in a somewhat artificial or forced condition?” At first sight it would appear that the quantities of carbonic acid in the air were anything but sufficient for the purpose, for according to De Saussure’s accurate and precise determinations of the amount, there were only about four parts in every 10,000 parts of air. These determinations have been confirmed by many other observers, and it was therefore not far wrong to say that the air contained in every 10,000 parts from 4 to 5 parts of carbonic acid. This was a small quantity; but when they considered the enormous volume of the atmosphere, when they considered that plants were

provided with such a beautiful apparatus for absorbing the carbonic acid diffused through the atmosphere, which was constantly wafted in all directions, and driven towards the leaves of the plants—when they further considered that there was no other source from whence plants could derive their carbon, and made the calculation of the amount of carbon contained in the enormous bulk of the atmosphere—they were forced to the conclusion that the quantity of carbonic acid in the atmosphere was sufficient for most plants. This idea did not preclude the other, that carbonaceous matters in the soil were most essential for certain purposes, but it was not the carbon in the soil which mainly supplied plants with this kind of atmospheric food. Observations of the wants of plants in this respect had been somewhat enlarged of late years, and he believed he was not wrong in stating that whilst there were some plants which might entirely rely upon the carbon which they found in the atmosphere, there were others which were greatly benefited by carbonaceous matters, which they were in the habit of calling humus, and which ought to be present, or at any rate which it was desirable should be present in the soil. He believed that cereal crops were not dependent in any great measure upon any carbonaceous or organic matters in the soil; whilst root crops, turnips, mangels, and others were materially benefited by the carbon present in the humus; whether it was in the shape of a prepared organic that the humus acted usefully as a source of carbon to roots, or whether it was because the humus in the soil was continually undergoing a change, and produced continually carbonic acid in the very soil which grew the roots, he left for the present undecided. Indeed, they had no very distinct experiments, nor were they easily instituted, to shew that organic matters as such were taken up by plants. But this was certainly known as a fact, and it was an important one, that the air in the soil itself contained a very much larger proportion of carbonic acid than the atmosphere resting upon it. Some years ago M. Boussingault made some very careful experiments upon the amount of carbonic acid which occurred in soils, and he found that whilst the atmosphere that rested upon the soil only gave four to five in every 10,000 parts, the air in the soil contained, in sandy soil recently manured, 217 parts of carbonic acid in every 10,000 parts. Shortly after rain the air from the same soil was again analyzed, and was found to contain as much as 974 parts of carbonic acid; evidently showing that the wetting of organic matter, and the rapid decomposition which through contact with the porous earth had taken place in organic matter, had led to the destruction of the humus and the formation of large quantities of carbonic acid. This threw some light upon the very startling growths sometimes noticed, especially with regard to root-crops. They knew how very rapidly young turnips started after a good shower of rain if the land had been well dunged, arising from the rapid production of carbonic acid in the soil. They looked in vain for this result in soils which had not been properly cultivated. And this led him to another remark—that plants and root crops especially, not only took up carbon through the medium of their leaves, but also in the shape of carbonic acid in very large quantities through the medium of their roots. It was especially useful to root crops to furnish them at an early stage of their growth with matters that furnished carbon in the shape of carbonic

acid, which he believed they took up very largely through the medium of their roots. Boussingault showed that whilst in calcareous soil there were in 10,000 parts of air only 87 of carbonic acid, and in heavy clay soil only 68, there were in pasture soils as much as 179 parts of carbonic acid to every 10,000 parts of air. Thus it would be seen that in all these instances, the quantity of carbonic acid in the soil was very much larger than the quantity resting immediately above it. In the next place he had to direct attention to perhaps the most important constituent of the atmosphere—he alluded to atmospheric ammonia. For a very long time this had been entirely overlooked; and it was very pardonable, since the quantity was so small that it could not be determined with anything like precision, and it was necessary to have recourse to the examination of the rain or dew to ascertain anything like an approximation to the truth. Perhaps the correct determinations were those that were obtained in France by M. Bineau, and also by M. Boussingault, who had done so much for the progress of scientific agricultural chemistry. According to M. Bineau, 1,000,000 parts of air contained only about two-tenths part of ammonia. The amount varied in different seasons, but not in different humus—the total amount of ammonia present in the atmosphere did not vary at all in the humus, but it did vary in different times of the year. According to the researches he had mentioned, the rain which fell upon an English acre carried upon the land about 23lbs. of nitrogen, both in the shape of ammonia and nitric acid. Indeed the amount of nitric acid in the atmosphere was somewhat larger than the amount of ammonia; but as both were small they might safely be taken together. Twenty-two pounds upon an acre was a very small amount, and they had to consider the very important question whether this quantity was sufficient for the requirements of plants. They pursued a very extensive series of experiments bearing upon this matter, and from them it followed that whilst there were some plants which might find a sufficient quantity of nitrogen in the shape of ammonia or nitric acid in the atmosphere in order to grow luxuriantly, there were others which were decidedly benefited if in addition to the atmospheric ammonia or nitric acid they were supplied through the medium of the soil with an additional quantity, either of ammoniacal salts, nitrates, or organic matters producing on gradual decomposition either nitric acid or ammonia. It was well known that cereal crops were more than others benefited by ammoniacal fertilisers, whilst those plants that were not in the same manner benefited by the ammoniacal fertilisers were those which they were in the habit of calling green crops. An interesting inquiry arose as to how it was that the cereal crops were especially benefited by ammoniacal manures supplied to the soil, and not root crops. It would seem that in the greater development of the leafy part of the green crops was the reason why they were more capable of assimilating the atmospheric food ammonia or nitric acid than cereals. So it would appear at first sight, and so they might judge perhaps correctly. But it was known that in certain soils ammoniacal manures were most useful even for turnips or mangels. It was plain therefore that it was only under certain conditions that root crops might be thrown entirely upon atmospheric resources for their description of food. When plants like turnips grow rapidly, it was generally the case that the soil contained a considerable quantity of organic matter, it was then that the leaves became rapidly developed. But when for some reason or other a deficiency of organic matter occurred, as was often the case in sandy soils, am-

moniacal matters were supplied with great utility even to root crops. Although therefore it might be said that ammoniacal manures did not benefit as a rule root crops, that atmospheric ammonia was sufficient in those cases, they had to be careful how they generalised observations which might be the rule in many instances. He knew as a positive fact that in sandy soils ammoniacal salts might be applied with great advantage to the growth of swedes, turnips, and other crops; but there were other instances in which those manures were wanted entirely. How necessary it was then that they should have precise and accurate observations upon these important matters, and how necessary that they should not be satisfied with general statements like those which had been made, and very frequently by men eminent as scientific observers, but wanting the qualification in their minds which would allow them to become the guides of practical men! These generalisations were most useful, but reducing them to practice was another matter. There were many theories which were extremely beautiful, simple, or interesting to all who took an interest in the progress of farming, but which, labouring under the one great defect that they were not sufficiently minutely carried out in all their ramifications, were not fit to serve the farmer as rules to guide him in his operations. The sum and substance of his observations upon atmospheric ammonia was this, that whilst they knew that under certain conditions and for certain crops—conditions which had as yet still more minutely to be examined—they had sufficient food of that description in the atmosphere, there were other crops, and more especially cereal crops, which did not find sufficient ammonia and nitric acid in the air to grow with sufficient rapidity and to produce sufficiently remunerative crops without the addition of nitrogenous manures to the soil. Upon the great influence of water, whether in the shape of watery vapour, dew, or direct rain, as necessary food to plants, he need not dwell, but he passed on to another effect of the atmosphere on vegetation. The observations he had hitherto made all tended to show the indirect influence which the atmosphere had in the nutrition of plants; but there was another part which it played on the growth of vegetables, which might be called the indirect one. This was perhaps quite as great as the direct effect; for although they might supply abundance of food to plants, if the condition of the soil was such that the plants could not grow, the food itself was of no avail. Now, the indirect part played by the atmosphere was so great in its effect, that they might say positively that all soils that were not penetrated by air were unproductive, no matter how much food there might be otherwise contained in it. Cases were constantly brought under his notice, of soils sent to him for examination which were characterised as unproductive, but which turned out to contain abundance of all the mineral constituents required for the growth of plants, and which required only to be thoroughly penetrated by the air in order to furnish an unlimited quantity of food. The atmosphere really exercised a most beneficial effect both on the inorganic and organic constituents that occurred in the soil. He had alluded to the large quantities of carbonic acid present in the air which was naturally contained in the soil, but this could not be produced unless the air found its way into the soil. An excess of organic matter in the shape of decaying roots or leaves indeed was so injurious, that many soils which on account of their retentive powers were not easily penetrated by air, and which contained much organic matter, were decidedly improved by burning away altogether that matter,

At first sight this would appear a great waste of useful material in clay soils, and certainly it was a waste in some sense, but if it produced a beneficial effect greater than the sacrifice made they could scarcely call it a waste. He made these observations because serious doubt had been entertained respecting the utility of burning. There were some soils so difficult to penetrate by air that the organic matter could not be destroyed in any other way, while its presence in an imperfectly aerated condition was rank poison to the growing plant. It was certain that the destruction of the sour humus, as it had been called—though in a chemical point of view all humus was acid—had been attended with most beneficial effects, and when recourse could not be had to proper means of aëration, this destruction had been practised with very great advantage to the succeeding crop, even in the case of a crop which, like the turnip or mangel, would be otherwise benefited by the presence of carbonaceous matters in the soil. But when they could effect the destruction of the organic matters by the atmospheric oxygen, the practical result, he had no doubt, would be greater. Not only did the air, and more especially the atmospheric oxygen, act upon the organic matters in producing carbonic acid, but it also had an important effect upon them in producing nitrates in the soil. The quantity of organic nitrogen in the soil was very large. Some years ago he made an experiment with the view of ascertaining how much nitrogen was present after the clover crop had been removed, and he had ascertained that it was equivalent to rather more than the amount of nitrogen present in 8 cwt. of Peruvian guano—that was taking 1 acre. It had been found that the clover crop was the most excellent preparation for the succeeding wheat—and it was known now as a fact, that in growing a good crop of clover a very large amount of root was left in the soil. It could not be maintained that the nitrogen, to the whole extent he had stated, would be available in the shape of nitric acid; yet, if only one-half became so available, the reason would at once be seen why clover was such an excellent preparation for wheat, and why a good crop of clover was almost invariably followed up by an abundant crop of corn. But in order that the beneficial effect should take place, it was most essential that the soil should be penetrated by the air—that after growing a good crop of clover immediate steps should be taken to work the soil, and the better the soil was worked by proper machinery the sooner the clover ley was broken up, the sooner the atmospheric air entered the soil, the more rapidly were the nitrogenous constituents of the root destroyed, and the more abundant were the nitrates found in the soil. He never examined soil that had been well penetrated by air, in which large quantities of nitrates were not invariably present. So much with regard to the indirect influence of the atmosphere in the nutrition of plants. The indirect influence of the air on mineral matters was also most important, especially in the case of clay soils. Clay soils in many cases contained an abundant store of mineral food, which was as essential as atmospheric food to the growth of plants; but in many cases it occurred in a locked-up condition, in which it was of little or no avail to the growing plants, and it was only when the air thoroughly penetrated the soil that it became available. It was by the introduction of atmospheric oxygen and carbonic acid that many mineral compounds belonging to the double silicates of alumina and alkaline, of ammonia and lime were gradually decomposed. In consequence of this remarkable composition, the surface of the soil becomes more porous and

powdery, and a stiff clay soil was by proper aëration reduced into fine earth, and at the same time there were produced the food so much wanted for the growth of the plant, and that condition which enabled the plant to absorb more abundantly atmospheric food; for the more porous the soil was, the more readily did it absorb ammonia and carbonic acid from the atmosphere. The atmosphere supplied an abundant store of food in a direct way to all plants; it also supplied nutriment in an indirect way in operating upon the organic matters of the soil, producing carbonic acid and nitrates in the soil. It operates upon the mineral constituents of the soil, eliminating from them the insoluble matters of a mineral character, and rendering available the important soluble mineral constituents found in all plants; and lastly, while effecting all these beneficial changes in the soil itself, it materially improves its mechanical condition, in virtue of which the soil acquires the power of availing itself more perfectly of the food existing in such great abundance in the atmosphere itself. In bringing the lecture to a conclusion he stated that he had been unable, from insufficient data, to introduce any new matter, but had rather confined himself to the reproduction of old well-known facts in a brief manner. All that he could attempt to do was to give a brief account of what was positively known with respect to the atmospheric nutrition of plants.

Mr. FERRIS: You tell us that rain furnishes 22 lbs. of ammonia and nitric acid to the acre. You have also spoken of the nitrogen in the roots of crops of clover being equivalent to 8 cwt. of guano; will you remind me of the number of pounds of nitrogen in 1 cwt. of guano? because that will connect the two statements.

Professor VOELCKER: Good Peruvian guano contains from 14 to 15 lbs. of nitrogen to the cwt. I mentioned only one example of the quantity of nitrogen in the roots and other vegetable remains that are left in the soil; but it of course varies. I am at present engaged in following up this investigation. One of the matters for investigation in the present year is an enquiry into the growth of clover, and I shall follow up that enquiry by ascertaining how far it is useful as a preparation for the wheat crop.

Mr. FERRIS: I gather that the dressing of 4 cwt. of guano would produce about 60 lbs. of nitrogen in different forms, or three times as much as the rainfall will produce.

Professor VOELCKER: Exactly so.

Mr. HOLLAND, M.P.: The Professor states that there is a large amount of nitrogen in the roots of clover. In growing and managing the clover crop, harvesting, and feeding off, you have to pay as much attention as you can to increasing the roots. If you work off the heads only, you do not injure the stems, the plant is still growing, and a large amount of root is formed; but, if you feed off the clover, you more or less kill the plant, and the root is not formed. This is considering the effect of the clover crop upon wheat would be of very great value.

Professor VOELCKER: The question is one that has already occupied my attention, and I am glad to be able to state that after two years' clover crop, leaving the first year's crop standing for seed, more nitrogen was actually obtained than when it was immediately fed off. The explanation is that the roots develop themselves much more perfectly when the clover plant is allowed to grow without being checked, as it would be by the nibbling tooth of the sheep. The question is a very important one in a practical point of view, and I am sure some of the members of this society will assist me, in case I

should require to extend the observations and experiments I have made in one part of the country, by sending me specimens. We should always have observations in different parts of the country, in confirmation of experiments in a particular locality, for we frequently do not know how far local conditions may produce a certain practical result.

Professor COLEMAN wished to know whether the comparative injury from feeding, as against mowing, in reference to the wheat crop, would not depend in a great measure upon the method of feeding—whether that plan which he believed was most economical as far as the animal was concerned, that of passing rapidly over the surface, allowing the crop to attain a height of 6 or 8 inches, and then at once feeding off, giving one day say to one spot, would not answer the same purpose as allowing the clover to run up to seed? It might be gathered from what Mr. Holland said, that mowing a crop would produce better roots than feeding off. That, however, was hardly consistent with experience. If the crop was continually gnawed down they could readily understand that, like a tree constantly topped, it would not produce root growth; but he should like the Professor's opinion as to whether, supposing it were fed off in the way he had suggested in the

case of poor but not clay soils, they might not expect a better result.

Mr. FRANK observed that it had been the immemorial practice to plunder the pastures for the advantage of the rest of the farm; but on the other hand it was said that the pastures were the landlord's bank. This was a paradox which had an important bearing upon the question under their notice.

On the motion of Sir John Johnstone, seconded by Mr. Holland, M.P., the thanks of the Society were accorded to the lecturer; and, in acknowledging the vote,

Professor VÖLCKER said he could not form any precise opinion as to the point raised by Mr. Coleman, but he proposed to make experiments, with the view of ascertaining the amount of produce, and what was left in the ground after treating a piece of clover in various ways. With respect to Mr. Frere's question, he could only hope that those who looked upon pastures as a bank had some other bank as well (a laugh). He had generally found that those who looked upon pastures as a bank from which they could continually draw, were not men who were very well to do, and certainly, if they were tenants, were of no great advantage to their landlords.

THE RISE AND PROGRESS OF THE STUDLEY, KILLERBY, AND WARLABY HERDS OF SHORT-HORN CATTLE.

THE WARLABY HERD—*continued.*

SIR,—The next tribe of Warlaby cattle whose history we shall endeavour to trace is that of the Broughtons. We have mentioned Broughton by Jerry as one of the small herd with which Mr. R. Booth, on removing to his late father's residence at Warlaby, recommenced the breeding of shorthorns. She was a cow of a superior stamp, and more than average milking capacity, and was highly thought of by Mr. Booth. She was the dam of Raspberry by Young Red Rover, a very fine bull, though rather larger than Mr. Booth approves. He was accidentally hanged by getting too far back in his stall. Broughton also gave birth to Young Broughton by Young Matchem, and Lady Stanley by Lord Stanley.

Young Broughton's daughter, Bliss by Leonard, who gave rise to the celebrated family since known by her name, was a neat, medium-sized cow, of a rich roan colour, and with good hair. Being a very heavy milker and regular breeder, she was wont to get low in condition; but when dry, like all of her family, got rapidly into good case, and looked very attractive in her holiday trim. She gave birth to Blithe by Hopewell, Bonnet by Buckingham, and Bridget by Baron Warlaby.

Blithe, whose descendants continue the family at Warlaby, was a very neat little roan cow, with remarkably well-sprung ribs; like her dam she was a great milker, and when dry, which was seldom the case, got quickly fat. She has been known to produce two or three calves in as many successive years without ever ceasing to yield her daily supply of milk. She was the dam of an excellent bull, Valasco by Crown Prince; an indifferent one, Knight of Warlaby by Windsor; and a very pretty little roan cow, Lady Blithe, by the same sire. Lady Blithe has been very prolific; though only seven years old, she has produced six calves, and all of them heifers. Of these, Lady Mirth by Sir Samuel is a good thick cow, with excellent rib and loin, and great girth; Lady Joyful by Lord of the

Valley (one of the pair of prize heifers at Worcester) is a massive, compact animal, full of hair; and Lady Blithe, some, her own sister, is equally promising. Lady Blithe has lately produced twin roan heifers by Lord of the Valley, whose propensity to beget twins is remarkable. The remainder of the Bliss family, descended from Blithe's other daughters—Bonnet by Buckingham, and Bridget by Baron Warlaby—are principally in the hands of Mr. Peel and Mr. Carr, the few which are not theirs being the property of Lady Pigot.

Bonnet by Buckingham was a compact, well-framed cow, with beautifully-laid shoulders. Though a great milker, she had plenty of substance, and when sold at the Killerby sale had a remarkably fine coat of long silky hair. She had been presented by Mr. Richard Booth to his brother, being at the time in-calf to Royal Buck. The offspring was Wide-awake, now the property of Mr. Carr. Wide-awake is, therefore, a grand-daughter of Buckingham on both sides, and inherits and transmits his excellences. This wonderful old cow, now more than twelve and a-half years old, is at present suckling, and doing full justice to her calf, Prince of the Realm by Prince George, now rising four months, while, at the same time, she carries more flesh than is usually seen in a three-year-old in-calf heifer. So much we may fairly say; but it would ill become us to enlarge upon the merits of her fair daughters, Lady of the Valley by Lord of the Valley, and Windsor's Queen by Windsor—nor is it necessary, for their perfectness are well known. Another of her daughters, Lady Grandison by Gainford 5th, graces the Branches pastures.

Bonnet herself was purchased at the Killerby sale by Mr. Anderson, by whom she was sold to Mr. Wood, of Castle Grove, in whose judicious hands she was destined to give birth to other offspring of equally distinguished merit. There she bred Prince Patrick by Prince Arthur, now the property of those spirited breeders, the Messrs. Atkinson, of Peepy, who have also recently purchased of Mr. Carr Lady of the Valley's last young bull, Knight of

the Grand Cross by Prince George; but, above all, she produced, at Castle Grove, Bustle by Valiant (10989). Mr. Wood more than once refused 500 gs. for Bustle, and finally sold her to Lady Pigot, at 8 years old, for 450 gs.; and she has since bred a heifer calf to Sir Roger. Bustle produced in Mr. Wood's hands Princess Royal, Princess Maude, and Princess Helena, all by Prince Arthur, and Princess Louise by King Arthur. Princess Royal, for whom Mr. Wood refused an offer of 400 gs., died of apoplexy a month before calving; but Mr. Wood had, in 1861, the satisfaction of disposing of Bustle's three remaining Princess daughters, with her grand-daughter Belle Etoile by King Arthur and from Princess Maude, for the high sum of £1,200, two of them being calves. Lady Pigot became the possessor of Belle Etoile, Mr. Peel of Princess Maude, and Mr. Carr of Princesses Helena and Louise. With the exception of Princess Louise, who has been on the Stackhouse herd two very good heifers—Princess Beatrice, and Princess of the Blood—these fine and valuable cows have only produced bull calves. Princess Helena was obliged to be slaughtered, but she had previously given birth to Prince of the Purple by War Eagle, which was sold by Mr. Carr to Mr. M'Dougall, of Australia; and Princess Maude, a most excellent cow, has presented Mr. Peel with four bulls, of which her twins, Hengist and Horsa by War Eagle (the first of them the second, and in the opinion of many who saw him, the first, in the two-year-old class at the Royal show at Worcester last year), and Abbot of Knowlmore by Monk, a young bull displaying very remarkable excellencies, are well known. Her last, Knight of Knowlmore, is a capital calf by Sir James. Lady Pigot's Belle Etoile has followed the same course, and added to the Branches herd two bull calves, the last a very promising one by Ravenspur.

In speaking, as we are, of the value of the Booth blood, it seems proper to dwell for an instant on the extraordinary prices realised by this one family. Assuming the value of Princess Maude to have been the 400 guineas which Mr. Wood refused to take for her, the price of Bustle, her four daughters, and her grand-daughter—six in all, two being calves—was £2,092 10s., or an average of £348 15s., an amply sufficient proof of the high value of the Booth blood. Of the animals themselves which produced this sum we need say no more. We may here, however, mention that Mr. Booth has lately refused an offer of £15,000 for *some thirty animals*.

But to return to the remaining daughters of Bliss—Bridget by Baron Warlaby we have already mentioned as one of the animals sold to Mr. Bolden. She was in calf by Crown Prince, and produced one of the loveliest shorthorns in the world in Mr. Bolden's well-known Bridecake, and afterwards two good cows, Mr. Torr's Britannia and Mr. Peel's Blissful, both by Grand Duke. Bridecake is the dam of Mr. Peel's Bride by Duke of Bolton, a short-legged, deep-framed, wide-backed cow; and Blissful was the ancestress of the rest of the Knowlmore Bliss family, amongst which is a heifer by Monk, "Boundless" by name, of which it is not too much to say that she bids fair to rival her queenly relative Bridecake. And indeed it may be observed generally of the Knowlmore herd that besides containing Princess Maude, who is pure Booth, and Bridecake's daughter and grand-daughter, Bride, and Bride of the Isles, which are very nearly so, it contains also several females descended from Bliss's daughter Bridget, which have been crossed by the first Bates bulls; and to those who admire the combination of the Booth and the Bates blood it may be said that nowhere can that combination be seen in greater perfection than at Knowlmore, while Mr. Peel's judicious skill in using to cows so bred such bulls as Sir Samuel and Sir James is likely to be attended with the best results.

Broughton by Jerry was also the dam of Lady Stanley by Lord Stanley. Lady Stanley produced Silk, which was sold to Mr. Pollok, of Mountaintown, and Sain, both by Buckingham, and was herself sold to Mr. Bolden, of Hyming.

Satin was all a dairyman could desire. In the full flush of her milk she was wont to suckle two calves, and require milking dry after them,

"Bis venit ad mulctram, binos alit ubere fetus."

Mr. Booth was recommended to enter her in the dairy cow class at the Royal Exhibition; but the great quantities of rich milk which she yielded so absorbed her fattening properties that she was seldom what Cuddy calls "menceful" enough for show. She produced but one daughter, Sarcenet, which failed to breed, and seven bulls, amongst which was—besides Windsor 2nd, and Messrs. Booth's very good and very useful animal Knight of Windsor—Mr. Housman's admirable bull Duke of Buckingham by Crown Prince. This grand and massive animal, who, at one time weighed 25 cwt. live weight, was the only instance ever known in the annals of the Warlaby reign of a Crown Prince bull becoming the property of a subject. He was presented by Mr. Booth to his nephews at Killerby, who sold him to Mr. Housman. Many a neighbouring herd bears the impress of his worth. His son Lord of the Harem has spread wide his name; while at Lune Bank many a valuable cow by him, amongst which may be particularly mentioned Duchess of Buckingham and Queen of the Harem, bears witness to the good he has done there.

The Princess Elizabeth tribe, the original progenitress of which was bought by the late Mr. Booth of a dairy-farmer at Ainderby, is now represented only by Prince of the Isles, a very lengthy, well-framed bull, with good shoulders, deep breast, and beautiful quarters; he is the son of Princess Elizabeth, and own brother of the famous Queen of the Isles. Princess Elizabeth by Crown Prince, was a large, lengthy roan cow, not quite so short-legged or thick-set as some of her companions, but combining milking and grazing qualities in a very unusual degree. Her own sister, Princess Mary, a compact, heavily-fleshed heifer, proved sterile; as did also Princess Elizabeth's daughter, the victorious Queen of the Isles. The latter carried all before her as a yearling in 1858, being first at the Royal Meeting at Chester, where she outshone all the gems in the Towneley diadem; first at the Yorkshire Meeting at Northallerton, where she also won the special prize of £20, and first at the County of Durham Show at Sunderland.

Christon, another of the animals with which Mr. R. Booth commenced his second herd, was from an Ainderby cow by Mr. Thomas Booth's bull Jerry, of the Lady Betty tribe. Christon herself was by Priam, of the Hahnaby tribe; her daughter by Roseberry, of the Blossom tribe; her grand-daughter by Buckingham, of the Bracelet tribe; and her great grand-daughter was Caroline by Fitz-Leonard, of the Isabella tribe. Caroline had twelve calves. Her first were twins, calved when she was very young, and with such difficulty as to permanently distort her spine. She was a prodigious milker, giving, it is credibly affirmed, when in the prime of her life, four average pailfuls of milk in the day. These two circumstances combined to make her a plain cow, but the merits of her daughter Alfreda by Prince Alfred, an excellent round-ribbed, strong-backed, massive white heifer, with a true Leonard head, and an apparently very robust constitution, indicate what her dam, with her beautiful shoulders and rich hair and colour, might have been but for her accident, and her excessive addiction to milk. Constance by Lord of the Valley, a grand-daughter of Caroline, has also produced twins.

Perhaps none of the Warlaby families has been more illustrious at home and more renowned in the field than the ancient family of the Blossoms: We find Blossom, daughter of Young Red Rover, and seventh in descent from Blossom of Fairholme, settled with other distinguished descendants of Hubback, on the lands of Warlaby, in 1835. She had issue Roseberry by Raspberry, Hawthorn Blossom by Leonard, and Baron Warlaby and Cherry Blossom, both by Buckingham.

Cherry Blossom was of a fine blood-red colour, with a little white. She was a noble animal, with massive fore-quarters, and of stately presence. She gained four first prizes at the Royal and Yorkshire Shows, vanquishing at one of them Mrs. Mason Hopper's all-conquering Violet, for which 850 guineas had been given at Mr. Carruthers' sale.

Baron Warlaby was a rather small, but very handsome well-proportioned bull, and a most impressive sire. He was out on hire for nine years, several of which he spent in Ireland, where he well upheld the honour of his family. In Mr. Dudding's herd he did such wonders that there was quite a run upon the Panton heifers, some of which might have challenged comparison with any Shorthorns of the day.

Hawthorn Blossom was a fine, level, white cow, with great milking capacity. She had eight calves—Benedict, Bloom, and Plum Blossom, by Buckingham; Rose Blossom, by Royal Buck; Thornberry and Highthorne, by Hopewell; Orange Blossom, by Vanguard; and Nectarine Blossom, by Crown Prince.

Bloom was a large cow, of an evidently robust constitution; she had not the refinement of form which distinguished her sister Plum Blossom, but was withal a very noble cow, and had a fine udder. She was never exhibited except as a calf, at the Yorkshire Show, in 1840, where she won the first prize. She was a gift from Mr. R. Booth to the late Mr. J. Booth, and gave birth at Killyerby to Venus Victrix (who, with her progeny, has already been described in the account of the Killerby herd), and to four bulls, of which two, Neptune by Water-King, and Dr. Buckingham by Hopewell, eventually found their way to America. Dr. Buckingham was bred by Mr. Ambler, who had purchased Bloom at the Killerby sale, by the advice of his bailiff, Mr. Dodds, a very superior judge of Shorthorns, especially, where superiority of judgment is chiefly shown, in estimating the merits and future capabilities of an animal in a lean state. Dr. Buckingham was used for some time in the Sittyton herd, and from thence transferred to that of Mr. Alexander, of Kentucky. Bloom unfortunately broke her thigh in turning out of the cow-house in a hard frost, and was slaughtered when five months in calf by Grand Duke.

Rose Blossom, by Royal Buck, was a first-rate animal; her loin, ribs, and chine were perfect, her shoulders neat and well out, but her hips were rather high and round, giving her very broad back a slightly hollow appearance along its otherwise level top. She won four prizes, including a first and second at the Royal Meetings in 1852 and 1853. She left no offspring.

Orange Blossom, by Vanguard, a rich creamy white cow, was perhaps even superior to her sister, but also proved barren. No one could see her without regretting that Blossom so fair should fail to fructify.

Plum Blossom by Buckingham was a level, lengthy short-legged cow, of great substance. She had abundance of hair, of a rich purple roan, a very sweet head, and high-bred appearance. While still but a slip of a heifer (for Plum Blossom was no hot-house nursing, but a wildling of the fields from her birth), Mr. Eastwood, visiting Warlaby with the late Mr. Booth, had the sagacity to foresee the perfection to which she would mature. He made tempting overtures to Mr. R. Booth to compass

her transfer to Towneley, which he flattered himself the latter did not seem disinclined to entertain; but on reviving the subject after dinner, Mr. Booth dashed his hopes, by intimating that he could not allow him to "put in his thumb and pull out this plum." Plum Blossom was the first prize cow at the Royal Meeting at Windsor, in 1851, and the second at the Yorkshire Show at Burlington the same year, her dam's sister Cherry Blossom, being first. Plum Blossom was the parent of Peach Blossom by Water King, and of Windsor, and sister to Windsor, by Crown Prince.

Peach Blossom was a handsome heifer, whose only faults were that her back rather wanted width, and her tall stood up a little higher than is consistent with neatness. She was only second to Bridesmaid in the two-year-old class at the Royal Show at Gloucester in 1852. She never bred.

Windsor may be said to have been the Comet of modern times; he was a very symmetrical animal, of extraordinary length, with a good masculine head and horn, a well formed neck, a very deep and prominent breast, and well covered obliquely laid shoulders; his back was admirably formed—firm and level—and his ribs were finely arched up to the shoulders, forming a cylindrical shape throughout; his quarters were very long and flat, his thighs, flank, and twist remarkably deep and full, and his legs short, and fine below the knee. From the top of his shoulder to the tip of his brisket he measured no less than 4 ft. 10 in. Permit me, sir, to quote from your own report of the Royal Agricultural Meeting at Carlisle, whither Windsor had been sent straight from the pasture field, the following pertinent remarks upon him: "The first prize bull is worthy of especial commendation, and this not only for his real merit in form and touch, his extraordinary length, that long, low, and even look, which argues so much for perfection of form; it is not only for this we would uphold him, but perhaps even more so for the condition in which—to borrow from another pursuit a most significant expression—he was brought to the post. Of all the bulls entered at Carlisle, Mr. Booth's white 'Windsor' was not only the best for shape and symmetry, but he was the best fitted to breed from. Compared, indeed, with some of the over-fed animals which stood near him, the superficial observer might wonder how he came to be placed first. It is, however, only the superficial that can be deceived in this way, while it is a very great fact to establish that a lean and really used bull did beat on his innate merit all that pampering and over-feeding could make up to show against him. As was well said by those who knew him best, he was too good for that." The writer of this report had an evidently just appreciation of the true build of a shorthorn bull. It was this "long, low, and even look, which argues so much for perfection of form," that made Windsor's *tout ensemble* so complete,

"*Longus, et in seipso totus, teres atque rotundus.*"

With such symmetry and utility of form he could not but come with honour out of every contest; and, indeed, his motto might have been, "*Veni, Vidi, Vici*;" for though he entered the lists but ten times (at the National and Northern county shows), he won, besides other trophies, nine first prizes and one second, being, to the surprise of many good judges, placed second to Lord Spencer's Vatican at Lincoln. After the Royal Agricultural Meeting at Carlisle, Mr. Booth refused an offer of 1,000 guineas for him from an Australian breeder, who subsequently raised his bid to 1,100 guineas. And a very beautiful and symmetrical cow is the "own sister to Windsor," with her brother's splendid forehead, finely curved ribs, and triple loin. She has unfortunately bred but one calf—the bull First Fruits by Sir Samuel, who, though not himself a

handsome animal, has left excellent stock in the herds of Messrs. Willis, Mitchell, and Stewart.

Nectarine Blossom by Crown Prince was another admirable specimen of the Blossoms, the heroine of many a field day; but we cannot paint like Cuddy, and shall leave her to him. "I'ae flaid I'ae oerdu ye javvering about beas. Nectarine Blossom, she wor a most strange good-like cow, a rale grand airy-looking beast, rayther, if out, a trifling ower big; but then she pearked hersel up saa, and walked saa stately, that it were a'maist impossible to find fant wi' her. Her forebows cam forrad like a beam end. Sich thighs and loins and crops, and a vara grand bag! Why, Captain Gunter man, Mr. Knowles, said at Hartlepool that for a' purposes she were t' best cow he had ivver clapped his ee on"—the generosity of which admission your readers will agree with us redounds greatly to the honour of the champion of the rival faction. Nectarine Blossom won five first prizes at the Royal, the Yorkshire, the North Lancashire, and the County of Durham Shows. At the latter she carried off the 100-guinea challenge cup, in 1858, in the cow class. The following year she was specially entered as extra stock and in-calf to compete for the cup again, a course which the words of the programme "for the best breeding animal in the yard" appeared in no way to prohibit. No objection had been made to the entry, and she was allowed to go into the ring with the rest before a word was said against it; and then proceedings were stopped, a special committee called, and, after half-an-hour's deliberation, it was decided that Nectarine Blossom having won the cup the previous year was not entitled to compete again, and she was dismissed from the arena. Never since the news of poor Queen Caroline's dismissal from the doors of Westminster Abbey, on presenting herself for coronation with our most religious and gracious king, George IV., had popular feeling so unmistakably manifested itself in the good town of Hartlepool; but the ferment suddenly subsided when the white rosette was seen gleaming on the frontlet of Queen Mab. Three lusty cheers rang out for the Fairy Queen, and one more for Warlaby and its victorious lord. Cuddy's beams, of which he had been so lately shorn, shone out again as he exultingly reiterated his accustomed vaunt: "They canna come o'er me in a just cause." Nectarine Blossom gave birth to Fitzclarence by Clarence, a massive, short-legged, useful bull; Sir James by Sir Samuel, a remarkably handsome, robust, substantial animal and excellent sire, as the herds of Mr. Peel, Mr. Pawlett, and Mr. Wood of Castle-grove attest; and Sir Robert, also by Sir Samuel, who dislocated his shoulder, and was slaughtered.

It is to be regretted that so many of this valuable tribe were dispersed at the Studley sale, to be frittered away or lost sight of through incongruous crossing. The Warlaby Branch appears to have had such a propensity to breed bulls that there is danger of the tribe becoming extinct in the female line, "Own sister to Windsor" being the last pale blossom on the decaying stem. Though the tribe has produced seventeen males (all of which, with the exception of Sir Robert, have been used in different herds), the parent stem from whence they sprung has broken down, and we have not unfrequently heard the fact of the exhaustion of this and the Charity tribe adduced to point a moral against in-and-in breeding, and to support the idea that fresh blood is required in the Warlaby herd. The illustration, however, would seem rather to warrant the opposite conclusion, for Charity was a daughter of Buckingham (half Cradock's blood), and grand-daughter of Leonard (half Raine's); and of the three daughters of Hawthorn Blossom which failed to breed, Rose Blossom and Orange Blossom were by sons of Buckingham and their dams by Leonard, and Peach Blossom was by Walter King (half Bates), and her dam and grandam by Buckingham and Leonard.

We believe that where infertility has occurred in the Warlaby herd it can in no instance be justly attributed to in-and-in breeding, but generally to causes which have led to the decline and extinction of States as well as of Shorthorn tribes.

We have already referred to an idea which has prevailed in some quarters, that the extinction of the Charity and Blossom tribes in the female line was the result of in-and-in breeding; we showed how untenable was this notion, inasmuch as it was difficult for Shorthorns to be less in-and-in bred than those in question; and we expressed our conviction that though the exhaustion of these tribes was in some degree attributable to their propensity to produce bulls, the infertility of some members, and the impaired fertility of others were due to causes similar to such as have led to the decline and extinction of States and human families as well as of Shorthorn tribes. Those causes we believe to be luxury and indolence. It will be observed that nearly all of this Blossom family have been more or less "trained" for exhibition, and have, therefore, necessarily been subjected to that system of forcing, which, by concentrating the vital energy and circulation round the digestive organs, deprives the generative ones of their due share of those important principles, and eventually the animal system of the power of reproduction.

In the human family the proportionate infecundity of the wealthy and the labouring classes is said to be as six to one, the advantage which the latter have over the former being doubtless attributable to their more frugal diet and active out-of-door life. It is fair to infer from analogy that the same causes produce the same effect in cattle. In both alike, too much and too rich food and too much ease sap the constitution, not only by inducing the unequal distribution of vitality to which we have just referred, but also by inflaming and vitiating the blood (which is the life of the flesh), and impeding, by inaction, the process necessary for its purification. Thus the interior organs, which are dependent for their healthy action upon wholesome supplies of the vital fluid, assume a morbid condition, and become incapable of adequately performing their functions. It appears to have been wisely provided by Nature that the organs concerned in reproduction should be the first to refuse their office under this state of things; for where the various vital organs of the dam have been impaired, the offspring (which, as is well-known, derives these portions of its structure from her) could not inherit perfect ones, and therefore a sound constitution. In confirmation of the preceding remarks we need only point to the fact that the greater proportion of prize animals do not breed at all, and the remainder rarely more than once or twice, whilst the offspring of the latter seldom attain to the dignity of prize animals themselves or can boast of average fruitfulness.

We would not, however, be understood to imply that the offspring of prize animals must necessarily be of feeble constitution. There may be, and doubtless are, animals so robustly organised that they may be subjected to this unnatural treatment without suffering such constitutional injury as would at once incapacitate them for the production of healthy offspring; but we believe that these are exceptions which rarely occur, except, perhaps, in the case of cows of such naturally-hardy constitutions as were the daughters of Hawthorn Blossom, some of whom we have seen camping out, day and night, when the surrounding hawthorns bore no other blossom than the snow-wreath. The mischief appears to lie less in the amount than in the *kind* of condition required by the judges, a condition which can only be acquired by an unnatural process. "Ask now the beasts and they shall teach thee." Nature has provided that the cow should obtain her aliment only by that exercise of her muscles which ensures

ulation and health; and she appears, with this view, have inspired the animal with a capricious taste, so that, however plentiful the herbage may be, she never keeps her fill from the grass immediately around her, but keeps constantly moving, as she grazes, from place to place. Under these conditions, the muscular and nervous system, upon which life depends, is healthily developed, and the fatty matter is dispersed through the muscular tissues to aid this development. Hence, as the animal matures, it acquires firmness, and, when mature, is what is called "hard fat." But the judges, we are informed, require soft fat, even in ripe-fed animals, that the skin should "handle" as though floating upon butter. The experienced sportsman knows that there is but one way of acquiring this butyraceous superstratum on a healthy animal, and that is by depriving her of the exercise which is necessary to the growth of muscle, or lean flesh, and cramming her with rich, fat-forming food. Under this system, which is called "training," almost all the fat which does not accumulate round the heart, liver, and kidneys, is deposited externally, above the muscular substance, which it gradually in great part supersedes. The animal has now acquired "quality," and is competent to undergo the established ordeal by touch; and if, on being tried by the rule of thumb" and fore-finger, she is found to have been sufficiently mollified to communicate a pleasurable sensation to the judicial feelers, she will probably become the sensation beast of the show-yard. It matters not what Science declares and Experience proves this obesity to be but the mask of disease, and the system which conduces to it most erroneous in principle and pernicious in practice: it is the policy of all aspirants to show-field known to cater to the prevailing fashion,

"Et omnes

Impendunt curas denso distenders pingui."

Mr. Booth strongly deprecates the system, yet is obliged to a great measure to conform to it. Though his cattle are absolutely unrivalled in their aptitude for healthy and ample development on pasture, and he has repeatedly sent them in blooming health and burly case, from the pasture to the show-field, and occasionally with success, he has so frequently, on such occasions, come off second-best. Hence it has been found necessary to subject, for an adequate period, such of them as are designed for exhibition to a system whose disastrous effects even the vigorous constitutions of his cattle have been unable finally to counteract. Hence the failure of female representatives of the Blossom and Charity tribes, and that in a herd whose unrodded members are so prolific that no less than six cases of twins have occurred at Warlaby since the 1st January, in every instance the sire being a Warlaby bull, and in our cases the dams pure-bred Shorthorns.

From a book lately published by M. Caunière, entitled *De la Médecine Naturelle, Indo-Malgache*, it appears that in a well-constituted adult the proportion of fat is not more than about a twentieth of the weight of the whole body. It may exceed that proportion to a certain extent without inconvenience, but it becomes a regular disorder when it reaches one-half. If there be any analogy between the human and bovine animal economy, it is generally supposed, what must be the state of a cast in whose system (as is not unfrequently the case amongst prize cows and sheep) these proportions of flesh and fat are reversed? It is idle, however, to condemn those who adopt this ruinous system, so long as the judges award their prizes and the public their commendations to animals in this unnatural state. The breeder must follow the fashion, or be left behind in the race. As systematically as the ancient husbandman selected from his herd his to propagate the breed, and that to bleed a victim at the sacred shrine, must the modern Shorthorn breeder,

who would maintain his position before the world, yearly single out the choicest of his herd for immolation on the altar of the Royal Agricultural Moloch. Nevertheless, were we the fortunate possessors of the Warlaby herd, hard as it might be, with such cattle, to forego the triumphs of conquest, we should be disposed to say—if such be the cost at which renown is to be purchased—

"Then rather let my herd, as leisure leads,
Wanton inglorious o'er the grassy meads."

The farm at Warlaby lies well together, and grows large crops of wheat and beans, and fine turnips, and, since it has been drained, good oats. The land is very clean, and kept in good heart. Willie Jacques, the foreman, "reckons nout o' your hawf muckins; it's all gane in a minute, it is. Aye, gie it planty, and ye'll git summat out. What's t' use o' fiddlin' o'er nowt?" The pasture land yields a luxuriant herbage, of mediocre quality, which appears, however, to suit cattle admirably. The usual mode of rearing the calves is by allowing them to suck either their dams or nurse-cows, giving them, in addition, after three months old, a little cake and corn. They are allowed daily exercise in fine weather, and after the first winter many of them are never housed again till near calving.

The nurse-cows are put to the high-bred bulls, and their calves are reared on porridge made of blue milk and oatmeal. The males are steered, and fed off at pasture on grass, hay, and turnips. They are generally sold at about 30 months old, at from £35 to £40. Some of the females are also fed off: others recruit the staff of nurses. Many of the half-castes have to rough it in the pastures, even through their first winter, and, indeed, not a few of the shorthorns have only another year's grace before being exposed to the like hardships. The in nutritious winter herbage is occasionally eked out by a supply of turnips scattered over the pastures, and when the ground is covered with snow the cattle are supplied with hay, which is stacked in the middle of some of the fields; but in an open winter they are left to earn their own livelihood.

A visit to the old Squire of Warlaby reminds one of the visit to Sir Roger de Coverley, in the *Spectator*. His establishment in-doors and out-doors consists chiefly "of sober and staid persons; for as he is the best master in the world, he seldom changes his servants; and as he is beloved by all about him, his servants never care for leaving him; by this means his domestics are almost all in years, and grown old with their master." Nor does the parallel stop here; there is between Mr. Booth and the worthy vicar of his parish, Mr. Raw, the same mutual esteem for each other, and hearty concurrence in works of charity and benevolence that subsisted between the good old knight and his chaplain. It does not come within my province to speak of the scholastic attainments and varied accomplishments of this excellent divine, nor even of his proficiency in that gentle craft, the love and practice of which was certainly considered by the biographer of the worthies of the church, Izaak Walton, to be essential to the completeness of a good man's character; but it will not be out of place to allude here to the success of his efforts to promote the improvement of the agricultural produce of his district—the better cultivation, we mean, of the turnip-headed, if not turnip-fed, little animals of the Colin Clout breed, many of whom had, previously to his time, never been entered in the *Horn Book*. Having made £30 by the sale of some golden-spangled Hamburg fowls (for which the vicarage has long been famous) he generously contributed this sum towards a fund for the erection of a much-needed school-house in the village of Ainderby; and Mr. Booth, with his usual liberality, adding to it double that amount, further subscriptions were soon forthcoming. A well-

attended school, said to be a model of good management, now rewards their joint exertions; and as the visitor in company with the good vicar saunters past the playground, and meets troops of little white and black-headed Yorkshire lads and lasses doffing their caps, pulling their forelocks, or dipping their curtsies, he is involuntarily reminded of Goldsmith's village parson, "to all the country dear."

"Around the pious man,
With steady zeal each honest rustic ran;
E'er children followed, with endearing wile,
And plucked his gown, to share the good man's smile;
His ready smile a parent's warmth express'd,
Their welfare pleas'd him, and their cares distress'd."

It is a pleasant picture we have drawn, of the pious and sensible village clergyman, the friend of rich and poor, and the connecting link between them; and long may it be ere the pride of caste, whether lay or clerical, dissevers, in England's quiet hamlets, the time-hallowed bond.

Why should we speak of Cuddy, that renowned custodian of the herd, "whom not to know argues oneself unknown," but to say that Cuddy at home and Cuddy in the showyard are one and the same Cuddy from top to toe? The same brown wide-awake, the same variegated kerchief knotted round his neck, the same brown "kytle," and leather gaiters, and the same bland smile of welcome and reverential Eastern salaam, meet you at the foldyard gate, as in the avenues of the show-field. No Jack-a-Dandy "airs in dress or gait" have ever taken possession of this bronzed and horny-handed receiver of first-class medals. "Sic like gim-crack teaglements dinna become me. I canna do wi' sic like fashery. Wad it besame me to be donnin', and preakin', and dixenin'? Is'e nobbut Cuddy, please yer honour." When at a Royal show one of his pets was passed over without notice, Cuddy waxed eloquent in his scorn of the judges: "I dinna care if I see bet in a reeght cause, but yan dinna like it when yan kens better. It gangs down vera badly. Nobbut to think o' my grand beast niver sees mich as commended, and she has won all afor her till now, and niver been bet, and sic a forend. Leuk at t'other bit thing, a cat-thighed gammerstang of a cratur, wi' nae mair beefstakes than I hae gotten a top of my ould baans. Seesto there, now (pointing to his own charge), it *Aes* gitten some breeches, and fills 'em. It shaws them judges to ken vera lile; there's a deal on 'em has nae reeght persaviance of a good beast, a deal as nobbut *sees* wi' their fing-er ends, and gies it to t'fuffliest, a beast as mebbey heon't a layer 'o lean beef atop of her ribs. Niver heed, they canna come ower me in a just cause. We see hae our day, nobbut wait a bit."

If ever there is anything wrong in the showyard, Cuddy is the foremost man to lend a helping hand, and it was he who courageously grappled and held Lord Feversham's great red bull when he unfortunately killed a poor fellow at Northallerton. Mr. Raw is nomenclator of the Warlaby herd, or as Cuddy expresses it, t'parson kersens 'em, and it is not the least onerous part of the old herdsman's work to burden his memory "wi' sie like new-fangled names. Yan canna bethink yansel on 'em. If yan da nat bottle 'em up vera tight they gang clean out o' yan's mind. It's a wonder where foaks rakes 'em up." On one occasion Mr. Booth had been so long confined to the house that one or two of the calves had grown quite out of his remembrance. "Cuddy," said he, "what is this calf?" Cuddy tucked his whip under his arm that he might be free to scratch his sensorium, and grasp at any mote of recollection that might float before his mind's eye. After standing for some seconds in the attitude of a meditative jackdaw, Cuddy thus delivered himself: "Weel, sir, I canna reeghtly think on of it names, but it's a t'calf as were calven t'neeght as ye runned for t'bel-

lowsee." We need not say that this little incident proved a sufficient remembrance to Mr. Booth. Cuddy has been Lord Chamberlain forty years, and his wife has been Lady of the Bedstraw nearly twelve.

Mrs. Cuddy, the foddering and littering wife, a small spare form well stricken in years, is always to be seen briskly stepping about, broom in hand, now sweeping the causeways or cow-byres, now distributing "skeps" of cut turnips to the inmates of the various loose boxes, now bobbing her quick curtsy to the visitor. A very pattern to her sex is this industrious dame, in her severe discountenance of all idle gossiping. Her voice is seldom heard except in an occasional snap at her lord and master, Cuddy, when all is not to her mind, or her spouse has paused from his work to have a crack about the beams. Even when Cuddy returns from the shows, and tells how fields were won or lost, eagerly as she delights to listen to his narrative, she will hide herself and her feminine curiosity behind a door, till, at her husband's recital of some real or imaginary slight which their mutual charges had received, an indignant "what a sham!" betrays her unsuspected proximity. Nanny—for such is Mrs. Cuddy's christian name—is acknowledged to be "a Britoner for bravery." "Tak care," she would say to a visitor going up to Crown Prince, "he is not to be depended on," and she would step up to him with a basket of turnips, and rub his old head confidently. "Hearing," says a visitor, "a cry of 'Cuddy! Cuddy! come here! here's Prince o' t'Isles loose.' I went to the yard, and there was Nanny waving her broom about, and keeping the huge animal at bay. 'I wad hae tied him up,' said she, apologetically, 'but he is sae hie I canna reach his chain round his neck to fasten him.'"

Cuddy has a valuable coadjutor in that ubiquitous factotum, trusty John White, who is butler, waiting-servant, valet, and head-nurse to Mr. Booth, and registrar-general of the births, deaths, and marriages, and all else that transpires in the Warlaby herd. John's father has been thirty years on the farm, and he has himself lived there in various capacities from his boyhood, and remembers the jubilation occasioned by the birth of Monica's twin daughters—Medora and Modesty. When illness had confined Mr. Booth to the house, and Cuddy had become less active, John made it his business, in addition to his household duties, to keep a watchful eye on the cattle—especially the young or ailing ones—in the neighbourhood of the house. So admirably did he discharge this self-imposed duty, so methodical are his habits, so retentive his memory, and so scrupulous his observance of his master's orders, that the *active* management of the herd has mainly devolved upon his shoulders, and Mr. Booth finds him an invaluable auxiliary.

Last, not least, comes doughty Willie Jacques, the farm-bailiff, who has been upwards of forty years in the family. He first lived with Mr. R. Booth at Studley, who sent him to Warlaby in the old master's time, to take the management of the arable land and work-people, and there he has lived ever since. Willie Jacques's pride is rather in the nameless nondescripts of the farm, the bullocks and half-bred heifers, which convert his marvellous roof and clover crops into goodly rounds and lordly barons of marbled beef, than in the pampered aristocrats of the herd, born to consume the fruits of the soil whether earned or not. Proud as Willie is of their triumphs in the show-field, nothing exasperates him like the failure on the part of any of them to contribute their yearly quota towards the increase of the herd. He would summarily execute all defaulters. "What's t' use on 'em?" he exclaims, in reference to any such: "plaguy weans! they be doin' nowt: they mud gang to t' butcher if they were mine, but maister's noan willin'." And while Cuddy meekly remarks to John White, "We mun hae patience,"

Willie Jacques flings on to his grey mare, and rides off to solace himself with a view of his ripening beeves, and his fine crops of wheat promising to yield their six or seven quarters of market oorn per acre, or to see that a full proportion of muck is being allowed for the growth of the turnips that are to beat "them Killerby crackin' lads, and that t'other Bainease chap. They want to drive all afoor 'em, but we can beat 'em yet wi' hawf o't noise." Willie Jacques has a capital head for tillage and general farming, and is always at his post, from which nothing can move him but the Christmas Fat Show at Smithfield. "I've seen thrang I canna gang," is his answer to all other invitations. Curt of speech and unceremonious in bearing is Willie Jacques in his sturdy northern independence; but get him upon the subject of his kind old master, and all the frost of his nature melts away, and you find that under that dry, almost blunt manner, a heart as kindly as a child's is hidden. In one of the rooms at Warlaby hangs an admirable portrait of this highly-respectable and respected steward of the Warlaby estate.

But there is one other personage, to forget whom in a sketch of Warlaby would be fatal to the character of any historian—a personage who, though seldom visible, has contributed to the visitor, perhaps not the least comfortable reminiscence which an Englishman carries away with him from any place of passing interest; and that is Ann, faithful Ann, that white-bibbed paragon of natty spruceness—the housekeeper. She came nobody knows how many years ago, to nurse the former kousekeeper, an old friend of hers, who was ill, and who died at Warlaby; and Ann continued until Master could find one to suit him, which he has never done yet, and so Ann is still there; and many are the visitors who can testify to the excellence of the pigeon pies, apricot tarts, and other delectable cates, which those brisk and clever hands have fabricated.

If we have not been deterred from attempting this simple portraiture of rural life by any alarm, lest

"Grandeur hear with a disdainful smile
The short and simple annals of the poor,"

it is because we believe that in the most imperfect sketch of their homely joys and hopes and fears, there are touches of nature that prove how near is their kinship to the possessor of the most illustrious pedigree in Burke's Human Herd Book, and how false is the philosophy that would ignore it; and also because we feel assured that much of the happiness of Mr. Booth's useful, though unostentatious life, has been reflected from the happy faces around him; much of his prosperity from the feeling in which he and they have alike participated—that they are all, master and servants, members of one body, with a common weal, a common interest; and that in caring for the well-being of each other they are caring for themselves—a truth on whose practical recognition the happiness and prosperity of agriculturists in general, doubtless, in great measure depends. The grand principle which has been preached for 1800 years, and of which Thackeray and Garibaldi have been the latest and most eloquent exponents—that true nobility has no necessary connexion

with noble blood, but with honesty, gentleness, self-denial, and courageous endurance of hardship—is beginning to come home to us at last; and when we consider how faithful to the trust reposed in them are the majority of these sons and daughters of toil, how respectful to their masters, and generally considerate of the feelings of each other, how unselfishly helpful of their neighbours in want and sickness, and how heroically patient and cheerful under their own many privations, we cannot but admit the truth of the doctrine, that there may be true nobility at the plough, and in the cottage.

"Honour and shame from no condition rise;
Act well your part; there all the honour lies."

But Grandeur may say, "If we must hear about these obscure persons, we might at least be spared these specimens of their uncouth jargon." Now, we hold that next to the vulgarity of despising our humbler neighbours comes that of despising their language. The Yorkshire dialect is not the barbarous *patois* it may seem to Southron ear, but a remnant of the language formerly in general use—the language used by courtiers, historians, and poets of former ages, by the pious pilgrim on his journey to Canterbury, and the chivalrous crusader on the plains of Palestine. Learned philologists are of opinion that the Lowland Scottish tongue, whose nervous, varied, and metaphorical dialect is used with such effect in the Waverly Novels, is but a corruption of the vernacular of the North of England, and especially of Yorkshire, in the North and West Ridings of which county there are many districts where the inhabitants still use the language of Chaucer, Gower, Wycliffe, and Spenser. It is, in fact, *we* who have defiled the pure well of English by the introduction of foreign idioms.

Before hazarding any remarks of our own upon the principles and practice of breeding pursued by Mr. Booth, we think we cannot do better than introduce some remarks upon that subject, which have been sent us by Mr. Wood, of Castlegrove, a gentleman whose excellent and well-known herd, bred for a length of time under his own careful superintendence, adds ten-fold weight to his long-weighted opinions. Mr. Wood's remarks will accordingly form the commencement of the next chapter.

WM. CARR.

P.S. It may have been observed that in the course of these letters I have committed the apparent inaccuracy of sometimes writing in the first person plural, and sometimes in the first person singular. This has been partly inadvertent, and partly from a wish to avoid the egotism implied in the frequent use of the latter form. Nor, in point of fact, has it been so incorrect as might appear; for though *I* have held the pen, it has been chiefly to chronicle information received from others. I have been largely indebted to Mr. Bruere, of Braithwaite Hall, for the facts I have been enabled to relate, and to Mr. Storer, of Hellidon, for many valuable suggestions and much original matter interspersed through the series.

W. C.

AGRICULTURAL EDUCATION.

Few subjects have given rise to a greater amount of discussion than the education of the farmer. From the earliest ages of the world the cultivator of the soil has been considered, in the eyes of the other classes of society, "a thick-headed species of the genus homo," upon whom the philosopher's stone has had no attractive force. On this head poets,

philosophers, and historians have hitherto been unanimous in their conclusions, and the burden of the song of our own times is that which was sung in Hebrew, Greek, and Latin long, long ago.

Why has the education of the agriculturist occupied so much attention? Why are we at the present day only dis-

causing a subject that ought to have been thoroughly and finally settled?

The answer to this, and the nine hundred and ninety-nine kindred questions that might be raised, may, one and all, be put into a nutshell; for what is a thorough knowledge of the science of agriculture but *paradise regained*, figuratively speaking?—a solution which must now be received, we fear, as a sad impossibility. Man himself is, physically speaking, a product of agriculture; and if there is an exception to this general rule, it must be "the man o' the moon," or some such personage amongst the clouds, and not an inhabitant of *terra firma*. In other words, agricultural education, in its most comprehensive sense, embraces a knowledge of every branch of science now taught, and of much that has yet to be discovered. There is evidently, therefore, a limited sense in which the proposition of agricultural education must be understood, and this limit, we fear, too often means little more than "*How to make the most of the land and the farmer*"; in other words, *How*—not to teach the farmer the different branches of the science of his profession, but *How* to make him a proficient in the art, so as to procure from the land the greatest amount of produce at the least expense, and thus be able to pay the largest rent, and at the same time to make the most of his farm, so as to provide for himself and his family; or, in the form of an interrogatory, What is the least amount of science that can be taught the farmer, so as to make him a thorough proficient in practice? Can a "regular system of limited liabilities" be got up, so as to make complete practical and scientific farmers at the rate of from £20 to £100 per head for boys intended for all professions, including farmers, manufacturers, and merchants?"

It would greatly simplify the general question, and do away with much of the above *pros and cons*, were the several branches of science requiring to be taught, specified and discussed separately. We speak here from some personal or practical experience in the matter, having been at one time professionally engaged to teach the several branches of the art, *practice with science*, at an agricultural seminary. When the proposition was first mooted to us, the greatest impossibilities imaginable were expected, relative to teaching students the several branches of the art, such as holding the plough, &c., at an age when they were without strength to handle even a common hoe in hoeing turnips! Some of them were of a delicate constitution, boys who had never at home put their hand to any implement of the farm, and who in future life never intended to do so; and yet it was confidently expected that a scientific and practical education would make them proficient at all sorts of farm work, equal to what we ourselves possessed, who had served our apprenticeship of twelve years, besides attending an University, and that too in a single season! To have placed such boys between the stiltis would have injured many of them for life. No doubt the majority required physical training, but the rough work of the farm was the very reverse of what they stood in need of, to swell the chest and develop the muscles of the arms, legs, &c., in order to qualify them for entering the field to learn the mechanical manipulations of the different branches of the art, as regular apprentices. All this, and a great deal more, the details of which it would be superfluous to mention, we had no difficulty in disposing of practically, so as to substantiate the general conclusion that the art, or rather the manipulations of the practice of agriculture, form one subject, but that the science of those manipulations forms another; that the agricultural student requires to possess a knowledge of the latter, in order to enable him to perform the former to the

most advantage; that the different branches of science may be taught in schools; that numerous experiments may also be performed in the class-room and laboratory; that students must be taught in the field the application of the science of delving, ploughing, seeding, harrowing, hoeing, mowing, carting, stacking in the stack-yard, thrashing in the barn, feeding stock in the feeding-houses, milking the cows in the cow-house, dairy operations in the dairy; but that, after all this is done, an apprenticeship of several years must be served to learn the numerous manipulations in the above branches of the art; and that when they, as apprentices, have finished their apprenticeships, only a few of them will be thoroughly proficient ploughmen, &c., &c.; and in point of fact, those who are masters of one branch, as ploughing, are often deficient at others, and *vice versa*, bad ploughmen being excellent cattle-men, or shepherds, and so on.

Such are the general conclusions which we deduce from our own experience, conclusions which we venture to say our readers generally will at once confirm as being manifest. We shall next proceed for the sake of further illustration to discuss some of the principal branches of agricultural education separately as above proposed, in order to show that the amount of knowledge required by landowners and the families of large farmers and small, and those of the manufacturing and commercial interests, is more a question of degree in the several branches, than a distinct sub-division of them into classes. In other words, the classification of the community into the agricultural, manufacturing, and commercial interests is without a scientific basis, and therefore it cannot form a solid foundation for any educational superstructure.

(1.) With regard to reading, writing, English grammar, and arithmetic, comparatively nothing requires to be said, as these several branches belong to the common requirements of all.

(2.) *Languages* other than English involve requirements somewhat different: a certain amount of Latin and Greek, for example, is necessary to enable students to understand the scientific names given to many things, were there nothing also to demand an acquaintance with those two languages. If a farmer is to send his son to farm in Lower Canada, he should learn French; if to East India, Hindostanee, and so forth. If he is to make him a merchant in connection with any foreign country, the language of that country should be learned. The *rationale* of all this we need not enlarge upon.

(3.) *Book-keeping* is the next branch of education that calls for special notice, as it, with the preceding, may be taught exclusively within doors, *i. e.*, in the class-room. It is commonly called "a commercial branch;" but the designation is rather conventional than scientifically correct, for the farmer and manufacturer also buy and sell, while they have to keep accounts that are not strictly speaking commercial; and the book-keeping generally taught at schools does not make suitable provision for the requirements of landowners, farmers, implement makers, builders, shoemakers, tailors, &c. All the boys, for example, require a knowledge of the principles of book-keeping; but when we begin to apply those principles to the requirements of practice, a very wide division takes place, and for this diversity our present school-books do not make suitable provision.

Under this head, therefore, the Royal Agricultural Society may aid the cause of education by giving a prize for a school-book on book-keeping adapted for its members, both for public seminaries and private tuition, the work to make suitable provision for landowners, implement makers, engineers, &c., as well as for farmers.

(4.) *Land-surveying*.—This is a branch of education that

involves field operations; it therefore follows that in accordance with experimental teaching, it cannot be taught exclusively in the class-room. What is usually taught in school-books as "practical land-surveying" only includes a part of land-surveying, viz., *office-work*. Euclid's "Elements of Geometry" for example, may be taught in the school; but what is usually termed practical land-surveying only includes the office work of finding the contents and plotting the dimensions. Thus, as the problem, we have—Given "the field notes," required the contents and plan of the field. But how, we may ask, are the field notes obtained? And the practical answer to this is by ranging the station poles, and measuring the lines and angles which they form. Two problems are therefore wanting, to render the above one given of any use in practice. The first of these two problems is, *To range the station poles*; and the second, *To measure the lines and angles which they form*. In the case of a single rectangular or triangular plane field, or any plane field enclosed by right lines or straight fences, the ranging of the poles is simple, and may be taught by illustration in the class-room, with the aid of a plan of the field; but it is otherwise in the survey of a whole farm or estate, where the ground is uneven, and the fences crooked; for under such circumstances the nature of the ground has more to do in determining the position of the station poles and lines, than the form of the fields. A little health-giving fresh air for the students is still more necessary in the case of the second problem, for the lines measured with the chain are not those sought and required for plotting. In other words, although the lengths of the chain lines are stated in school-books to be so many chains, yet these lengths are not found by measuring the lines with the chain, for they are obtained by trigonometry. This is true even of the "base line" of the survey; for unless it lies in a complete flat or "horizontal level," which is seldom or ever the case, its deviation from the horizontal plane must be found by an angular instrument, so as to obtain its true length as given in the school-books. Hence the practical conclusion.

In practice there is an exception to the above, which further shows the necessity of out-door education or lessons in the field, viz., "*surface measure*," as in ploughing, trenching, paring and burning, reaping, &c., and other farm works of this kind done by contract. In examples of this kind "the lines do not close," consequently the plans of fields and the lengths of the lines given in school-books do not apply to them; and to practical farmers they form not the less interesting cases, for although the surface length of lines cannot be plotted on to a plan, surface measure is nevertheless that which most concerns them. Hence again the practical conclusion as to the philosophy taught being experimental.

Some of the higher branches of land-surveying, such as the setting out of curve lines, the apportioning of land, levelling, and the mensuration of solids, require a special notice. They are involved in road, railway, river drainage, irrigation, and canal surveying, and are perhaps more interesting to landowners, and those who follow land-surveying, railway and drainage engineering professionally, than to those only engaged in farming; but as stewards, bailiffs, and the practical men of landowners are for the most part farmers' sons, and even the sons of ploughmen, it is not very easy to set practical limits to the extent of education required by farmers'

sons in the higher branches of land-surveying. The more advisable course, therefore, is to give them a thorough knowledge of the whole; and if the sons of small farmers, ploughmen, and others cannot afford to pay for this at public schools or private seminaries, school-books should be of such a character as to enable them to finish their education, as very many of this class do (and as we shall find all must do in some other branches of science), during the long winter evenings and leisure hours in summer-time.

Under this head much remains to be done to meet the educational requirements of the present age. Plato had written over the door of his class-room or academy the very significant inscription, "*Let no one ignorant of geometry enter here*;" and the same may be placed over the entrance to 12, Hanover Square, and the door of every agricultural society and club in the kingdom; for the elements of geometry, as taught by Plato, Euclid, and the early geometers, apply to something more than land-surveying, or geometry in the literal sense of the word. In modern times, however, while we admit that the propositions of Euclid, Archimedes, Apollonius, &c., apply to mechanics, and other branches of science, yet we limit their original and legitimate application to geometry or land-surveying itself, geometry and land-surveying being synonymous terms for one and the self-same branch of science and education! We have even expunged Euclid's "Book of Data" from our school-books, although it was the first book taught by himself and by the geometers of his day, and although it has come down to our own times the most useful of all his books in field operations! We have even nicknamed that which Euclid defines to be not geometry at all (if we may use the phrase), "*practical geometry*" in the majority of school-books, viz., the drawing of figures with mathematical instruments; for in the field there are no black strokes or curve lines drawn with compasses, for the lines in practice lie between the station-poles, and are invisible to the eye, which is exactly the definition given them by Euclid. And this is not all; for such is our apostasy to the march of progress, that it may be safely said that ninety-nine out of every hundred of modern schoolmasters who teach Euclid's "Elements of Geometry," or rather his first six books, could not range the station-poles in applying them (the Elements) to much above half the propositions therein; and if this is true as to the application of the first six books of Euclid to practice in the survey of a plane superficies, it is many degrees more so in applying it to the higher branches of land-surveying in his other books, including his work on conic sections, which has not come down to us, but for which we may substitute the works of Archimedes and Apollonius on curve lines formed by sections of the cone and of the cylinder, all of which were taught in the class-room and field by the early geometers of Italy, Greece, Egypt, and Chaldea. But although our schoolmasters, and many of our university professors, have lost this knowledge during the dark ages that have intervened, that is no valid reason why they should continue to remain in this state. It is, on the contrary, a very cogent argument why farmers' sons, and other students in land-surveying, should be taken to the field, and there taught how to apply all the propositions of the ancient geometers that have come down to our time, and also how to use the improved surveying instruments of modern times in all field operations. ENGINEER.

THE BREEDING AND MANAGEMENT OF HORSES.

A discussion meeting of the Framlingham Farmers' Club was recently held, the President, Mr. F. S. CORRANCE, in the chair. The subject for discussion was, "Farm horses: their keep and general management," introduced by Mr. N. G. Barthropp and Mr. D. Smith, jun.

The minutes of the last meeting having been read, the CHAIRMAN called on Mr. N. G. Barthropp to read his paper.

MR. BARTHROPP said: When I consented to introduce the subject for discussion, I did not flatter myself that I could bring before you any particular improvements in connection with the subject on the card, but I thought it my duty as a member of the club to take my share of the labour that must necessarily be incurred to keep up the interest in societies like this. As you are aware, the subject, as stated on the card, is, "Cart horses: their keep and management." Now, although no doubt the proper management of cart horses is an important matter for the consideration of the farmer, I have nevertheless felt that it is not one upon which a very great deal can be said; and as Mr. Smith's name stands in conjunction with my own upon the card as the introducers of the subject for discussion, I have requested permission of our President to depart somewhat from the text laid down on the card, and to treat of the breeding and rearing of other descriptions of horses as well as cart horses. I find, in looking over the Journals of the Royal Agricultural Society, that valuable papers on the breeding and general treatment of different kinds of horses have been written by Professors Spooner and Gangee, Mr. Burke, &c. When I first began this paper, I intended to quote from these papers, but I found I could not do them justice. I therefore determined to leave them alone, and advise you to read them yourselves. In the first place, whether we breed cart horses or hunters, in order to stand a fair chance of success, it is necessary to have some fixed principle to go upon, and this I think cannot be arrived at without some knowledge of physiology as applied to breeding. It is a very interesting study, and I would strongly advise the younger members of the club to look into it, as I feel certain they will be able to turn it to profitable account in their breeding of different kinds of stock, while it will give additional interest to their occupation. I will read to you part of one of a series by Dr. Shorthouse that I met with in a newspaper the other day. Some of the statements will no doubt surprise you, but the theory advanced will explain cases that perhaps some of you have met with, which have appeared strange freaks of nature, but which nevertheless are in accordance with the immutable laws of Providence. Admitting the theory, therefore, that the sire and dam have each their different influences to exert upon their progeny, the breeder must endeavour to make use of this knowledge to his own advantage. I have been induced to treat of the breeding of hunters, and well-bred horses generally, from the fact that the principal noblemen and landed gentry of Ireland, observing that the breed of good weight-carrying hunters has deteriorated very much during the last few years, have considered the subject of so much importance that they have formed themselves into a committee to consider what steps can be taken to restore the breed. They have also applied to the council of the Royal Agricultural Society of England for advice and co-operation, and I expect the matter will be brought before Parliament very shortly; for, as Ireland has hitherto supplied the greater part of the remounts for the cavalry, and great difficulty being now experienced in getting horses of sufficient power, combined with breeding for that purpose, it is considered to be a subject that ought to be taken up by the legislature. Whether the evil can be remedied by the establishment of government breeding studs, as is the case in France, Germany, &c., or whether it must be left to individual enterprise, I cannot tell; but it is certain that good horses were never more difficult to meet with than at present. Hitherto the farmers of Suffolk have contented themselves with the celebrity of their cart horses. There has, however, during the last few years been a great depreciation in the value of these horses, and, except in a few

particular cases, we do not hear of Suffolk horses and colts making very tempting prices at the Michaelmas sales. Taking into consideration, then, the falling off in the supply from Ireland, and the great dearth of good weight-carrying horses throughout England, why should not the Suffolk breeder follow the example of his Yorkshire and other northern brethren, and turn his attention to the breeding of the class of horse for which there will always be a sale? It may be said that heavy-land farmers have not room to keep their colts till they are fit for the dealer. But why, again, should not some of our large light-land men, who have plenty of marshes near the sea, invest some of their capital in buying up promising one and two-year-old colts, and thus fill up the gap between the breeder and the dealer? This custom is pursued to a great extent in Yorkshire and other horse-producing counties. There are several reasons why the breeding of "riders," as they are called, has frequently disappointed the Suffolk breeder. First, they are not particular enough as to the mares they breed from, but expect the horse to do nearly everything; and if they are lucky enough to possess a good mare, they are frequently induced, by some chattering half-drunken horse leader, to put their mare to the first horse that comes into their yard; whereas, if they would trouble themselves to think whether the horse would suit their mare or not, or ask some friend who really does know the points a horse ought to possess to advise them thereon, the chances are they would be spared such annoyances, as well as certain loss. Again, the Suffolk breeder, good manager as he may be of his sheep and ballocks, does not generally pay that attention to his young "rider" he ought to do; the consequence is, the unfortunate self has to shift for himself "about the yards," and is very, very lucky if he has not some rather curious blemish long before the time comes for him to be turned into money; his owner is consequently disgusted, and vows he will breed no more "riders." There are enterprising men in this neighbourhood; let them, then, go into the north, or, if they have not confidence in their own judgment, let them commission some good judge to select for them one or two good, young, sound, well-shaped mares, with proper action, good temper, and whose pedigrees they can depend upon; for remember how much the dam has to do with it. Let them select a stallion with equally unexceptional qualifications. Let them take care of the produce, giving it a liberal allowance of corn during the first year, at any rate; and remember never to allow it to lose the flesh in the winter that it has gained during summer. And I can see no reason why as good horses should not be bred in this part of Suffolk as in any other county, for a dry climate is natural and favourable to the horse. And now, perhaps, I may be expected to describe what I call a good, well-shaped mare. Now, almost all men fancy that they know something about horseflesh, and would think me very impertinent were I to question their judgment. I am free to admit that the generality of men know a good from a bad-looking horse; but it is only those who have a natural taste that way, and who have given the subject great attention, who can look a horse over point by point and give you an opinion worth having. If, then, it is difficult with a horse before you to understand what would at once strike the eye of the judge as points of excellence, how much more difficult must it be for me to convey to you by any words of mine what I consider ought to be the shape and make of the "hunter brood mare." First, then, as to size. The most valuable horses are those that can carry the most weight; and although it does not always follow that the 16-hand horse can beat one of 15 hands, yet most men like to be on a horse high enough to enable them to see what is on the other side of a fence as they come to it; I therefore think the hunter brood mare should not be less than 15½ hands. It is sometimes said, "A horse does not go on his head," and that it is not an important feature; but I think a good head is a great setting off to a horse. I would have it well proportioned to the size of the horse, and care not so much for a "pretty head" as a good intelligent looking one—no matter if it is rather long, provided it is lean, with a

indly expression of eye, nicely hung on the neck, clear between the jaws, to admit of the trachea, or windpipe, having full lay, and free from all thickening of any kind; the neck should be light, yet running gradually to strong, well-laid shoulders; the back should be of moderate length, with ribs springing well from the chine, a well-arched loin, two long hind quarters; the tail "on the top of his back," as it is called, is pretty enough to look at, but I believe the horse with their drooping hind quarters will be found the fastest. The thighs should be full and muscular, running down to clean, big hocks, flat hind legs, good fetlock joints and set. It is important that the mare has deep, as well as good springing ribs, muscular, not fleshy shoulders, good deep brisket with plenty of room for the lungs to play, rums well developed, and standing square on good flat fore legs, the sinews of which should be free from all appearance of fleshiness, but be hard and wiry feeling, and running into strong fetlock and pastern joints, with feet free from all appearance of contraction or flatness. This description of the essential points of a horse is perhaps a very imperfect one, but I know not what more to say about it, further than, above all things, secure good oblique shoulders, and strong thighs and hocks. Nice straight fore legs are doubtless very desirable, but I would rather put up with a horse with arched fore legs, and that was a little ross-ankled, provided his shoulders and hind legs were good, than have the best-formed fore legs ever seen, with upright short shoulders; remember, however, that it is of every horse with high withers that is desirable, but the hinders should be long and well laid into the back. The chief points of excellence I have enumerated in the mare are, in all respects, the same in the stallion, with perhaps an exception that his form should be more compact, his joints more firmly knit, and his general appearance denoting the possession of great power in comparatively small compass, and he must be thoroughbred. As to the necessity of this, I find Mr. Corbet, in his Essay in the Journal of the Bath and West of England Society, saying, "The great improver then of his species is the thoroughbred horse; and as a maxim, if you expect the produce of one half or even three-parts bred mare to be worth rearing, you must put her to a sire as pure as 'Eclipse' himself. There may be occasional exceptions, but these are not to be trusted or taken as precedents. When certainly we see fine powerful three-parts bred horse, with plenty of substance and style about him, a good head, fine shoulders, lean hocks, and so forth, we feel willing enough to have one like him. But in this case we have a forcible illustration of the fallacy of the proverb; for 'like does not get like.' Put the clever three-parts bred stallion to the equally clever three-parts bred mare, and can we do so with the assurance that they will produce anything as good as themselves? Most decidedly not." I must say I quite agree with Mr. Corbet in his opinion; at the same time it does not necessarily follow that because a horse is thoroughbred that he is fit to breed from, for there are lots of brutes travelling through the country with, perhaps, "a long pedigree and a flaming account of what their sire or grandsire may have done, or even perhaps themselves may have accomplished over a short course with a light weight," that are, nevertheless, the very reverse of what a thoroughbred one should be for getting hunters. Some years since I took great interest in the study of the stud-book, and I then could tell you the pedigree of almost every horse of note, and whether his blood was celebrated for speed or lasting qualities. Of late years I have been out of the way of it; have, therefore, requested a friend of mine, well-versed in the stud-book lore, to tell me the best strains of blood for hunting purposes. He says the chief strains are the Touchstones, "Melbourne," "Birdcatcher," "Emilius," and "Blacklock." Of these "Touchstone" is more especially adapted for racing purposes than for hunting, being very speedy, with very powerful quarters, but with upright hinders, and badly-formed fore legs. This shape is singularly to be seen in all his stock, which are generally sound of wind, and usually bays or browns: the old horse himself as never known to get a chesnut. His blood comes to us now chiefly through "Orlando" and his sons "Trumpeter," "Diophantus," "Zuyder Zee," "Chevalier D'Industry," "Fitz-Rowland," &c. The "Melbourne" blood is remarkable for size, substance, fine open oblique shoulders, and

good legs and feet, and whole dark colours; for country purposes it is difficult to find better than these good points. There are more large horses unsound in their wind than small ones of every breed, and for this reason the "Melbourne" blood has some few detractors, but it is staying blood unquestionably, and when we see such animals as "Canezon," "Blink Bonny," "Meteora," "Mentmore Laas," "Mentmore," "Middlesex," "Cannobie," "Prime Minister," and "Oulston," we can afford to look leniently on the faults of others; the latter three, with "Young Melbourne," "Arthur Wellesley," and one or two others, are the stallions now covering by him. The "Birdcatchers" are mostly undersized horses, and in colour strongly incline to chesnut with silver hairs; they are neat, level horses, on short legs, but have too often small hocks, disposed from their formation to be ourby, and when a horse can be found without these drawbacks with sufficient size, and a mixture of larger blood, it is quite the sort for hunting purposes. "Stockwell," the grandest of his descendants, is free from them, but "Rataplan," his own brother, has the curby formation, as had "Daniel O'Rourke." Many good hunters were got by "Birdcatcher," in Ireland; but in the days of his popularity many horses were fathered on him which he never got, and if not in the Stud-book, "Birdcatcher" pedigrees are not always to be trusted. The "Emilius" blood is always to be prized for country purposes, being of medium size and generally strong, thick, symmetrical horses, with true formation and fine "Orville" heads. "Agreeable" (formerly covering in Essex) was an example of this, as was "Recovery," who was selected to be modelled for the St. James's Park statue. "Emilius's" half-brother, "Muley," is also notable for the great size of his stock; and I have a great opinion of the staying qualities of the blood for hunting purposes. "Blacklock," himself a very big horse and a very good one, comes to us chiefly through his sons, "Brutandorff" and "Voltaire," the former the sire of "Hetman Platoff," both father and son the sires of large, upstanding, coaching-looking stock in the North—and the latter, the sire of "Volligeur" and his brother "Barnton," alike handing down the family character in the size and hardy colours and constitutions of nearly all their stock. On the turf they do not come to early maturity, and are more distinguished for staying qualities than for speed. There are a few strains distinct still from these. The "Ion" blood (himself a beautiful horse) comes to us through "Wild Dayrell," and "Pelion," highish horses, and the latter with indifferent fore legs. The "Dr. Syntax" blood we have (crossed with "Touchstone") in "Newminster," and in "Newcastle," a double cross of it, a small horse, "Knight of Avenel" and "Malcolm;" it is undeniable for gameness, but generally too small for country purposes. The size, colour, and shape of "Melbourne" and "Emilius," with some staying, game, blood-like "Tramp," "Catton," or "Whalebone" blood, is the mixture to be sought after for country purposes. Having now, very imperfectly I allow, brought before you the subject of breeding and rearing a better description of riding horse than we are accustomed to see in this neighbourhood, I must leave it to the judgment of individual members of this club to determine whether they will travel out of the usual routine of bullocks and sheep, and sheep and bullocks, and substitute as a part of their farm stock one or two good brood mares, and this not merely as a matter of fancy, but with a desire to profit. As my name has been associated for several years with the Suffolk cart horse, it would, perhaps, not be right that I should entirely pass the subject over, especially as it is in accordance with the text on the card. What, then, has been said as to the shape of the hunter and riding horse applies equally to the cart horse with the exception of the shoulders, for whilst you cannot well have the shoulders of a riding horse too oblique, those of the cart horse ought to be more or less upright, so as to allow him to throw his weight into the collar. It is equally important with cart horses as with others, that attention should be paid to their breed, selecting those that are remarkable not only for their form, but for the hardness of their constitution, and for their activity. With regard to stallions, it is frequently said, and with much truth, that they are made too fat. Now, for myself, I would never breed from a travelling cart stallion that was not fat, for I know enough of the business to be certain that his owner would have

made him fat if he could. Now, as it costs no more to keep a good horse than a bad one, and as there is an immense difference in the value of the two animals, and as the cultivation of land by steam will no doubt go on to increase, I see no prospect of the breeding of inferior cart horses becoming a very profitable business; I would, therefore, strongly advise you to breed only from good mares and by the best stallions. By adopting this course you will have a fair right to expect the produce to be worth rearing, and the difference you will have paid for the service of the horse of 10s., or even £1, will be amply repaid you in the increased value of the foal. Some three weeks back there were something like a dozen cart stallions shown on the market hill in this town, and I feel certain that it would be cheaper to pay even £5 for the use of some of those horses than to have the services of the others gratis. As to the rearing of foals, I think they should be kept well, especially if promising fillies; they will then be ready for sale should an opportunity offer: if not, they will be fit for work at an earlier age, say in the autumn of their second year, when two of them may do the work of one horse. But, remember, never let a colt be knocked up; if you do, he is almost sure to be a slug all his life; in fact, no horse should ever be overdone. The feeding of cart horses is a most important item in the economy of the farm. The question is, what is economy? Certainly not starvation, or keeping the horse below his work, but rather keep him above his work. It is scarcely necessary for me to speak of the various methods of feeding cart horses, as it must vary with the nature of the soil. Where stover is so plentiful that you can allow it *ad libitum*, no doubt a horse will do very well with the bushel of beans per week with chaff, but there are not many farms where it would be convenient to allow such a supply of stover. Good fresh bean or pea straw cut into chaff with the stover, and an allowance of beet-root cut with Gardner's cutter, will be found a more economic mode of feeding in my opinion. In this neighbourhood carrots are not much grown, but where they are they are unquestionably first-rate and cheap food for horses. I have heard of horses being kept in good condition with beet-root and stover without corn, but I never could find it would do so with my own horses. One great point I think is, that the horse drivers do not spend so much time with their horses as they ought to do; another is, that generally there is not sufficient stable room to allow of the horses being kept under cover, as it must be wrong when a horse has been at work all day in winter that he should be turned out into an open yard at night and exposed to any amount of rain or snow. A shed in the yard is of little use, as one or two horses are sure to be masters over the others, so that if they attempt to get under cover they only get driven out or kicked, and very often a farrier's bill is the result. So desirable indeed do I feel it to be that no water should be allowed to fall on a horse's back after his day's work is done, that I venture to assert that a horse in a loose box or covered yard would do better on a bushel of corn per week, than with five or six pecks if exposed to the vicissitudes of our climate in an open yard. Having made these few remarks on the feeding of cart horses, I will conclude by giving you the experience of a friend of mine who has paid great attention to the subject. He has come to the conclusion that it is better, taking all things into consideration, to keep a small number of well-fed horses, than a large number on inferior food. There is less outlay for horses, harness, &c.; fewer men are required to work them; there is no excuse for a small day's work being done, if the horses are well fed and in good condition; besides which, if the horses are in good condition, the men naturally take a pride in attending to them, which they will not do if they are poor. His farm consists of 480 acres of arable, all heavy land and heavy mixed soil. He keeps 19 horses, that are selected with a view to hardihood and activity, and he finds that large horses do not last so long as horses of medium size; in fact, he says, "Above all I dislike a large horse, even if he could pull a castle down at a slow pace." In the following scale, the provender is charged at an average price of—beans at 16s., and oats at 12s. per coomb; hay at £3 10s. per ton; and beet root or swedes at 2d. per bushel. After harvest the horses are put upon full feed, for September, October, November, and half of December, and the allowance per week is—

Beans	5 pecks....	5s. 0d.
Oats	2 pecks....	1 6
Hay	1 cwt.	3 6
Root	4 bush.	0 8
10 8.....15 weeks....		
£8 0 0		

Half December, all January and February.

Beans	3 pecks....	3s. 0d.
Hay	1 cwt.	3 6
Root	4 bush.	0 8
7 2 9 weeks....		
3 4 6		

Half February, all March, April, and May.

Beans	5 pecks....	5s. 0d.
Oats	2 pecks....	1 6
Hay	1 cwt.	3 6
Root	4 bush.	0 8
10 8.....15 weeks....		
8 0 0		

June.

Beans	5 pecks....	5s. 0d.
Oats	2 pecks....	1 6
Grass or tares	2 0	
8 6.... 4 weeks....		
1 14 0		

July and August.

Beans	3 pecks....	3s. 0d.
Clover, grass, or tares ...	3 0	
6 0.... 9 weeks....		
2 14 0		

So that the cost of each horse would be.....£23 12 6
—(Applause.)

Mr. D. SMITH, jun., said no doubt they were aware that the cost of keeping up a stud of farm horses in proper condition, so as to be able thoroughly to perform their day's labour, amounted to about 25s. per acre, which was about equal to the rent of the farm. They seemed to be walking on very quietly with this load, much in the same way as their forefathers did—i. e. about Michaelmas they took their horses to the homesteads from the pastures. On their return from their day's labour they were put in the stable to eat at the rack of hay or clover hay until the teamsters had finished their dinners, when they gave their horses a bait of corn and chaff, after which they were again fed from the rack till the orthodox hour of eight, when, hail, rain, snow, or blow, they were turned loose into the straw yard, sometimes with a shed, sometimes without one, to partake of bean stalk or other straw or colder, or some hay. Here they remained till 4 or 5 the next morning, when they were again taken to the stable and baited with chaff and corn. After which, during the men's breakfast, they were fed from the rack with hay, until it was time to resume the labours of the day. This system of management prevailed from Michaelmas to the middle of May or June, when the horses on return from work were turned out to grass if there were pasture enough on the farm, sometimes baited morning and night, and sometimes not; and upon farms on which there was not enough pasture, tares were grown and given to the horses in the yard. How far this system was right formed the answer to the text of the discussion of that evening. He could not plead to a superior system of management, much, he thought, to his shame, as he fancied he observed great waste in the management of his horses, and this matter had occupied his attention to some extent, but he supposed he was influenced by a feeling that he should every year get through as well as the last, and by a want of thorough knowledge of the subject. He would now endeavour to answer the text. Up to the present, for the cultivation of their farms they had to depend principally upon

the horse. How long and to what extent from this time they would continue to do so, time alone would tell, but at present they must trust to the horse. The animal he should select for the work of the farm would be of the medium size, not too long in the leg, with a good middle, smart and active. In some situations, the steepness of the hills, and the heaviness and retentive nature of the soil, might require more than ordinary strength; but upon the lands in cultivation in this neighbourhood a horse of medium size was best, for it cost much less to keep than a large one. He advocated the keeping of at least one brood mare. As Mr. Barthropp had gone so fully into the question of breeding, he merely alluded to it, and recommended that a colt should not be put to work till he had attained his third year, by which time he would have cost full £30. As to keep, he recommended a good supply of nutritious food. From Michaelmas to June 1st, and from September 1st to Michaelmas, comprised about forty weeks, during which the horse had the hardest work to perform, and during that period he should be fed almost if not entirely at the home-stead, and during the remaining twelve he might be kept in green food. He had drawn up two tables of the feed of a horse for the year. The first was as follows:—

1½ cwt. of hay or clover per week for	
40 weeks, at £4 per ton	£12 0 0
10 coombs corn at 15s.....	7 10 0
1 ton of straw and chaff.....	2 0 0
50 bushels of roots at 8d.....	0 12 6
12 weeks' grass at 4s. 6d. for 12 weeks	2 14 0
	£24 16 6

That would be feeding the horse at the rate per day of 24 lbs. hay, 6 straw and chaff, 7½ corn, 9 roots. Total, 46½ lbs. The second scale was—

2 tons clover.....	£8 0 0
12 coombs oats and beans	9 0 0
1½ tons straw	8 10 0
50 bushels roots	0 12 6
12 weeks' grass	2 14 0
	£23 16 6

He would, under this system, have 16 lbs. clover, 9 lbs. corn, 4 lbs. chaff, and 9 lbs. roots. Total, 48 lbs. per day. As to management, it was not right that the horse should be turned directly into the meadow. They did not take sufficient care of their horses, for, as Mr. Barthropp had said of riding horses, by keeping them well they would get a much greater amount of work out of them. The stable should be at least eight or nine feet from ceiling to floor, well ventilated, cleaned out every day, and the wall whitened with limewater. The rack should be as perpendicular as possible, so as to prevent the seeds getting into the horses' heads, and the manger should be rather deeper than they were in the habit of having, for the purpose of giving them rather more cut food. A friend of his had told him that he put up his horses' food with a chaff cutter, and had a lad to feed them, the men who worked the horses having nothing to do with the feeding, and he found that a much cheaper system than the ordinary one. He had lived in several other counties besides Suffolk, and he did not know that in any it was the custom to turn the horses out into yards and pastures after the day's work as here. Economy was the great object they should study, and he should be pleased to find them acting upon a more economical plan than heretofore if possible.

Rev. J. H. GROOMER said it occurred to him that one great cause of the defects which had arisen in the breed of horses in Ireland was that in their over-anxiety to procure a certain kind of horse they had lost certain pure breeds. When he was a boy, there was a stock celebrated for trotting—the Shales stock; and he asked if it was not a pity that that stock had been lost, as it probably was very useful for crossing with pure racing stock? In the cart-horses he remembered there formerly was a pure breed of bays, which had been lost, and he questioned whether they had been wise in selling the old pure stock of cart-horses for the sake of such a matter of fashion as colour. The agricultural shows had been so far injurious as to set a particular fashion, and thus

caused pure breeds to be lost. He also believed serious mischief resulted from the over-fattening of stallions. Great fatness was generally taken as a proof of a strong constitution; but was there no better criterion of a good constitution? The Yorkshire breeders did not use their riding stallions in such a fat state, but rather when in a hard condition; and why should not the same be the case with cart-horses? He would like to know whether physiologically a given character might not be stamped on a race, and whether horses being kept excessively fat might not, in the course of many generations, produce such a change in the constitution of Suffolk cart-horses that in the end the animal would be possessed of great fattening capabilities at the expense of his muscle, and degenerate from a muscular into an animal like the shorthorn bullock, with greater tendency to secrete fat?

The CHAIRMAN: What do you think of that, Mr. Grey?

Mr. GREY (Parham): Not anything. (Laughter.) The fact of a horse getting fat was a proof of good constitution. If a horse would keep fat, he did not want so much food. It was true riders were not made fat, but they were of an entirely different race of horses. He thought the value of a travelling horse depended much on the leader; there were many leaders who were such drunken fools they did not know a horse from a donkey. (Laughter.)

Mr. G. GOODWIN said he never had a horse on his farm that he thought too fat.

Mr. GEO. JEAFFRESON said they would not injure a cart-horse by allowing him to get fat, for the fat did not take the place of muscle in him whilst he had active exercise, and therein was the difference between the horse and the bullock; for the latter was shut up in a shed or a yard, and never had any exercise, and the result was that fat took the place of muscle.

Mr. BARNES did not see any harm in letting the horses into yards after they had been some hours in the stable and got dry.

Mr. HOLMES thought more horses were injured by keeping them out in pastures than anything.

After some further discussion,

Mr. BARTHOFF, with reference to Mr. Groome's statement as to the Shales breed of trotting horses, said the decline of that breed was owing to the alteration in the method of travelling which did away with the demand for trotting horses. Nevertheless, last year he was judge at a show in Yorkshire, where there was a class of 21 brood mares of this breed, with foals, and nearly as large a class of stallions. As to bay Suffolk horses, Mr. Catlin had some very fine teams of them, but there was always a doubt whether they were of the true Suffolk stock. With respect to the fatness of cart-horses compared with riders, no one would think of showing a fat hunter or thorough-bred horse, because his body would be too big for his legs, and that sort of horse was not wanted fat and heavy; but in the cart-horse weight was necessary. Mr. Jeaffreson had answered the question whether fatness would deteriorate the breed, and he might add that many entire horses travelled twenty miles a-day and still were what was called "beastly fat;" but a horse's fat would be found to be firm, whilst a bullock's was soft and pappy. He was surprised to hear any members advocate turning horses out at night into open yards. Let them only fancy a horse coming home on a foggy day in November in a very wet state. He was shut up from three to eight o'clock in a stable, and it was impossible for his coat, which would then be long, to get dry. He got into a cold sweat, and was then turned out into the open yard when very likely it was raining fast. When he lived at Cretingham he had a covered yard open on one side—not warmer than outside, but dry and sheltered from the rain.

Mr. BARNES, Kettleburgh, said the horse would be dry after being in the stable from three to eight.

Mr. BARTHOFF: Let him be dry, what is the use of turning him out to get wet?

Mr. BARNES: We can't do anything else.

Mr. BARTHOFF said the landlords ought to build covered yards.

A short discussion then followed as to turning horses out to grass for twelve weeks, from June to September.

IMPORTANT MEETING OF THE CORN TRADE.

On Wednesday, May 11, a numerous and influential meeting of the corn trade was held in the Corn Exchange New Subscription Room, Seething-lane. To receive a Report from the Committee appointed at the meeting held on the 27th ult., to consider the question of metrage, weighing, and portorage, on corn, &c.

Mr. Millis Coventry, who presided at the last meeting, was called to the chair.

The CHAIRMAN, in opening the proceedings of the meeting, said he might state in the first place that the committee, which was appointed at the last meeting held in that room, had met several times to consider the various subjects referred to them, and had had communications with the different authorities in regard to the portorage and weighing of corn. And the committee were of opinion that it was only right to call the trade together again to give them information of what had been done, to explain the present position of the case, and to take their opinion upon the whole matter. Mr. Kingsford had kindly acted as chairman of the committee, and under his direction a report had been prepared, which would now be read to the meeting.

The report was then read. From this document it appeared that the committee had had several meetings since their appointment, on Wednesday the 27th of April, and had had two interviews with the Lord Mayor and the authorities of the city. The committee further stated in their report that they had also met the representatives of the Fellowship Porters. The committee, after mature deliberation, came to the following resolutions:—"That it is desirable to substitute weight on all corn and seed liable to metrage, in the place of metrage as heretofore."—"That the weighing of corn be under the control of the city and certain members of the trade."—"That the charge for portorage should be one halfpenny per cwt. on quantities of corn over 149 cwt., and three-farthings per cwt. on smaller quantities." The last resolution having been communicated to the representatives of the Fellowship Porters, it has been agreed to by them.

The report concluded thus:—"The committee have received from the city authorities a proposal to undertake the weighing of corn at the rate of three-eighths of a penny per cwt. And fully considering that it will be desirable to have the authority of the city for weighing, they recommend to the trade that the proposal made by the city authorities be agreed to." It was for the purpose of considering this proposal the present meeting was specially convened.

The CHAIRMAN: He might state generally that the committee were received at the different interviews most courteously by the Lord Mayor and City authorities, who expressed a desire to meet the wishes of the trade, if possible; and, while ready to defend the interests of the corporation, were yet quite willing that the income which was derived by the City from the metrage of corn should be reduced if they undertook the weighing under the new system. The City authorities informed the committee that the profit derived by the City from the metrage of corn was, in round numbers, about £13,000 a-year, and they made the proposal to the committee which had been read to the meeting. The City authorities further stated to the committee that the proposal, if agreed to, would reduce their profits to about £5,000 per annum, and they were to give up a charge of £2,000 which they made for pockets. They intended to abolish the office of pockets, and simply to get remuneration for the trouble that would be incurred in the weighing of corn. He thought if they could get the co-operation of the City in the establishment of a body of men to weigh the corn, who would give satisfaction as dealing fairly and impartially between man and man, without paying too dearly for it, it was desirable at once to secure it. It was requisite that they should have an efficient staff of weighers, and such a body was most likely to be established under the management of the City. It should be remembered that at times a large fleet of vessels arrived, and sometimes difficulty was experienced in getting a quick discharge of cargoes. Now,

under such circumstances, it was of importance to have the cargoes discharged as rapidly as possible, and he did not think that could be done better by any body, than by one under the government of the City. The body under the Fellowship had agreed to reduce the charge now paid on portorage; the reduction on this charge would be about one-third. Under the proposed new arrangement there would only be two authorities—the authorities for weighing and the authorities for portorage. The gross receipts of the City from this source of revenue had been about £37,000 a-year, but their expenses were about £23,000 or £24,000, which seemed a very considerable sum. But they had about 195 meters, and putting their earnings down at £100 per annum each, a sum of £19,500 was at once accounted for. The committee, for the present, only laid one question before the meeting, in order that they might be enabled to give an answer to the City on the subject; and he thought it right to state that the City authorities were anxious to have an answer on the following (Thursday) morning. The committee of the corn-trade appointed at the last meeting were unanimously of opinion that the trade ought to agree to the proposal of the City. If the proposal should not be agreed to, the City would go to Parliament in defence of their rights and privileges, and of course all preceding arrangements would be withdrawn, and everything upset. The expense of contesting the point with the City in Parliament, and the uncertainty of the result, should, in the opinion of the committee, be well weighed before the meeting rejected a proposal which was calculated to confer great advantages on the trade, and which involved the expenditure of only a few thousands a-year, spread over a large amount of corn. He concluded by inviting remarks on the subject which had brought them together.

Mr. STEPHEN A. RALLI thought they must all be of opinion that their thanks were due to the committee for the pains and labour they had taken on the subject, and for the satisfactory arrangement they were desirous of making with the City authorities. And they must also admit that the City authorities in their negotiation with the committee had acted in a very liberal spirit towards the trade. The City only asked for £5,000 a year, instead of £13,000. He was of opinion that the proposed charge of three-eighths of a penny per cwt. was a very reasonable one, and that they ought at once to accept it. It should be borne in mind that in London labour was much dearer than in other parts of the United Kingdom, and if they agreed to the proposal so liberally made by the City, they should have a responsible body of men who would act fairly and impartially between buyer and seller. That being the case, he was of opinion the meeting would experience no difficulty in at once adopting the recommendation so judiciously made by the committee. And he thought they should be very thankful to the gentlemen composing the committee, who had taken so much trouble and pains to establish a good feeling between the trade and the City, and to obtain from the City authorities a proposal so fair and reasonable. He concluded by moving: "That the recommendation of the committee—that the proposal of the City authorities to undertake the weighing of corn at the rate of three-eighths of a penny per cwt. be accepted—be approved of and carried into effect."

Mr. ROBERT ASKER seconded the motion.

Mr. LANDELL did not rise to make any objection to the proposal made by the City, but he wished to know how the trade would be situated when a vessel got into the docks? He saw nothing wrong with the terms proposed by the City authorities, but he wished to know whether they would be able to bring the dock companies to agree with the terms proposed? When vessels were in the docks, the City meter was perfectly helpless. He should like to know if any arrangement had been made by which the charge in the docks would be the same as in the river.

The CHAIRMAN said that question had not been overlooked. It had been discussed in committee, but they had had no communication from the dock companies, or from any one who had any authority on the subject. The business of the committee

had been principally to fix the price with the City, to get rid of meters. The trade now paid 1½d. per qr. for each man's labour for meterage, and they had their own charges for weighing, besides. They had chiefly gone into the question of money to be paid to the City, without going into details as to what was to be done with the docks. The question of price was really the only question they had to do with, in dealing with the City. The committee offered a smaller sum than the one mentioned in their report, and the City authorities proposed a larger one. The committee considered that the City had met them liberally in agreeing to do what they proposed to do.

Mr. LANDELL said he thought the work would only be half done if the City could not control the owners of the docks.

The CHAIRMAN: The Fellowship porters had agreed to do for 2½l. the work for which they had hitherto been paid 3½d., and the Fellowship porters would be very glad if they could do the work in the docks. In that case the trade would only have them and the City to deal with. The Fellowship porters said they should be very glad to contest the legal point with the Dock Companies if they were backed up.

Mr. EDWARD WHITE apprehended that the City authorities would, if their proposal were accepted by the trade, go to Parliament with a Bill for the purpose of converting the meters into weighers, and conferring upon weighers the privileges now held by meters, and they would become weighers in the docks instead of the weighers found by the Dock Companies (Hear, hear.)

Mr. A. WATNEY said this was a momentous question, which ought not to be decided in a hasty manner, and he therefore proposed, as an amendment to the motion, "That the further consideration of the subject be postponed for a week."

The CHAIRMAN: We have to give an answer to the City to-morrow (Thursday).

Mr. WATNEY: The statement that the City was willing to come down from a profit of £13,000 to £5,000 did not seem to him satisfactory. The City authorities were not in the habit of giving up £8,000 a-year very hurriedly. He thought they should postpone the further consideration of the subject for a week.

Mr. HENRY ASTE supported the motion. They must have an efficient body of men to act fairly between buyer and seller, and that body must be paid for their services. If they made any further delay he was afraid they should not be able to get the Bill effecting the necessary alterations through Parliament this session, and the present objectionable system must go on. If the City wished to have for weighing corn £5,000 a-year, let them have it: he would not ask them to do it for less, for they undertook the responsibility of delivering four millions of quarters of corn-stuff per annum in the City of London. Further delay would do them no good. He thought they had been treated very liberally by the City.

Mr. GROVES (as the reporter understood): That does not affect the docks.

Mr. ASTE: Who could control the docks? At the present time the City of London had the power to send in meters to measure, and the City authorities would go to Parliament with a Bill conferring upon weighers the privileges now possessed by meters. And no doubt the Legislature would pass that bill.

The CHAIRMAN: From what he could gather, the matter

in question was a certain amount of money. And as the trade would save £8,000 a year by it, he thought they ought to accept the proposal made by the City authorities. If they did not agree to the City terms, and give an answer on the following morning, the negotiations would be at an end, and the City authorities would go to Parliament in defence of their vested rights and privileges. The City had met the trade in a liberal spirit, but if they gave as their answer next day that the matter was off, they should then be in a state of confusion. He wished gentlemen to understand what would be gained by present action and what lost by delay.

Mr. CHAMBERS: As regarded the porters at the docks the Committee had made no arrangement—they had no power over them, though they might have made arrangements with the river fellowship-porters.

Mr. E. WHITE: As regarded the fellowship-porters they had agreed to do the work for a smaller sum than at present, as stated in the report. It was true that they had no control over the portage charges in the docks, but if those charges were excessive, and the river became as clear and pure as it was said it would be before long, those engaged in the trade could themselves find a remedy by discharging their cargoes in the stream without going into the docks (Hear, hear).

The CHAIRMAN: We have to settle the question respecting the docks afterwards.

Mr. WHITE: The only profit derived by the City of London was through the meter or weigher, not from the portage.

The CHAIRMAN: At present the case between the City and the trade was simply a question of price. Should they accept the proposal made by the City?

Mr. STEPHEN A. RALLI: What was the object of the amendment? The object, he understood, was to give time to the meeting to consider, during the next week, the proposal of the City. Now, after the explanations which had been given by various gentlemen present, he thought that every one understood thoroughly the proposal which had been made by the city to the committee; and he did not see what they should gain by deferring their decision for a week, because they knew then as much as they should a week hence. The object of the amendment was plain. Mr. Watney was opposed to the privileges of the City of London, and he could not say that he himself was an advocate for the privileges of the City. But they must consider, before they supported the amendment, what would be the consequences of its adoption. Supposing they passed the amendment, the arrangement between the committee and the City would be at an end, and the trade would be obliged to follow the old system, and pay as much as they did previously, and then they would have to contend with the City in Parliament. If the City proposal were an unreasonable one he should not support it, but he did not think it was—he thought it was fair and liberal. They must have an accredited body of men to act between buyer and seller, and such a body would be at once secured by accepting the proposal of the City. The payment of £5,000 a-year for weighing was a very small one when extended over three or four million quarters of corn (Hear, hear). He hoped the meeting would reject the amendment, and support the liberal arrangement made between the committee and the City authorities. In this case the City had acted most liberally.

On the question being put from the chair the amendment was lost, and the original motion, approving the recommendation of the committee, carried by a very large majority.

After a vote of thanks to the chairman the meeting broke up

THE LAW OF HYPOTHEC.

Two important meetings have been held during the last month in Scotland—the one at Haddington, being the ordinary meeting of the East Lothian Agricultural Club; the other at Edinburgh, in the Hall of the Chamber of Commerce, when the Lord Provost took the chair. The subject at the Haddington meeting was, by appointment, the Law of Hypothec; that at Edinburgh was on the follow-

ing Wednesday, and was avowedly for the purpose of obtaining the abolition of the law. This latter meeting was the most important one that has yet been held on the subject of this crying grievance, and the Hall was crowded to such an excess that many farmers and others were compelled to go away, not being able to obtain even standing room.

We referred to this Law of Hypothec a few months ago, and pointed out the injustice of it to the creditors of the farmer who is under a sequestration. This injustice was exposed and dwelt upon by many of the speakers at these meetings, and the hardship suffered by those who unsuspectingly give credit to or purchase produce of the farmer. Mr. George Hope, of Fenton Barns, who moved the first resolution at the Edinburgh meeting, showed that the law by giving the landlords such power over the property of the tenant encouraged them to let their land to men of small and inadequate capital. By not calling upon them to pay any rent for two years after entering upon the farm, they are enabled for that time to trade upon the fictitious capital thus created. But, at the end of the two years, they require credit for manure and stock, which, if their characters are fair, they obtain. If a bad year ensues they fall in arrear with the landlord, who then sequesters the property, sweeps off every pennyworth, and leaves the merchant and the cattle dealer without redress, probably to the amount of one penny. "There are other classes," said Mr. Hope, "who also frequently suffer great hardships from the failure of tenant-farmers, and who also cannot help giving them credit. I allude to country wrights, smiths, bakers, and brewers, the two latter of whom supply food for the reapers in harvest. As a rule, farmers are generally sequestered in October, or within three months after the 1st of August, the last term for the payment of the rent of the crop of the preceding year. I have known numerous cases of bakers and brewers who supplied the food to the reapers who cut the crop in September that was sequestered in October and paid the landlord in full, whilst the others never got a farthing, or at most a paltry dividend. But a sequestration is often used by landlords as a shield to protect their tenants from the diligence of their creditors, as it is then impossible to seize either crop or stock, unless the creditor agrees to pay all arrears of rent. But what is still worse, cases have occurred of farmers having purchased large numbers of cattle and sheep, and quantities of feeding cakes and manures, and also drain tiles, *which have not been on the ground a week, and were still unpaid for, when a sequestration took place, and by these very articles the landlords were enabled to secure the whole of their arrears of rent, while the original owners did not receive a penny.* Some people might be wicked enough to allege collusion in such cases, and to call both landlords and tenants a pack of swindlers; but doubtless such doings are quite according to law." We have given this long extract, because it fully exposes the injustice of the law of sequestration. Equally so is that part of the law which arms the landlord with the power of following the produce of the tenant after it has been sold and paid for, and compelling the miller or merchant, or any other purchaser, to pay for it again to the full amount. We exposed this most iniquitous and anomalous custom—or there is no written law to sanction it—at the time of the Ayrshire case being on the carpet; and we are glad to see that some at least of the landowners appear to be thoroughly ashamed of it. But it is with regret we read the letter produced by the Secretary at the Edinburgh meeting from Mr. Peter M'Lagan, in which he declares that he sees no alternative between the law of hypothec and the demand on the tenant of two years' rent in advance as an equivalent! One would have supposed that the proposer of this monstrous idea would have seen the folly as well as the inutility of it, for certainly it would help to bring down rents with a run. Would any tenant having just sufficient money at his command to stock his farm, be fool enough to agree to pay out of that capital two years' rent, at the rate of three or four

pounds per acre per year, and thus hamper himself before he had put a plough into the soil? Certainly none but capitalists, beyond the mere stocking and cropping of the farm, would ever think of hiring land on such conditions; and the few of that class who *would* do so, would take good care not to pay an extravagant rent for it. The plan, therefore, would cut both ways: it would prevent all but wealthy persons from taking land, and would thus so curtail the range for a choice of tenants that rents would be reduced probably below par.

But what right has the landlord to demand this two years' rent as an equivalent for the custom of hypothec? We get on very well in England without either; and not only does not the landlord lose his rent, but compared with Scotland, very few of the tenant-farmers become insolvent. One of the speakers—Mr. Dalziel—said that the law in England gave the landlord the right to reclaim corn that was sold by sample, if rent was due. We have had some experience in country matters; but we never before heard of such a law here, much less of its enforcement. The landlords have quite power enough, without so unjust a law or custom as that attempted to be put in practice in Ayrshire, but which a sensible jury ignored. They can follow the goods of a tenant, and claim them everywhere if rent is due, provided they are not *bona fide* sold; but if it can be proved that they are so sold and paid for, he has no further claim upon them. It is probable that the custom (not law) prevailed in England formerly, as well as in Scotland; but, like many other bad customs that were good in another state of society, this has gone into desuetude, for we never hear of it, nor have done for a century past at least; and we are quite certain we shall never hear of its revival.

Mr. Hope, of the firm Maclean and Hope, stated two cases that had occurred with him, in which landlords had demanded payment for seeds or grain they had bought of farmers in the open market. In one case the proceedings were quashed, because the goods lying at the railway station might be said to have been sold in bulk; the other case would have proceeded, but a friend of the landlord represented to him that it would make him unpopular, and he desisted. Mr. Hope dwelt upon the injustice of not making an equitable division of a tenant's property upon his failure. He stated that during the last twelvemonths the dividend he received on the farmers' estates was only 3s. 4d. in the pound—just half what he had received from other estates. On the other hand, the landlords invariably got 20s. in the pound for their rents, besides the value of permanent as well as temporary improvements on the farm, which amounted to 5s., 10s., and, in some cases, 15s. in the pound over rent, and thus the landlord reaps a double advantage, and may well cling to the law.

We have been told that the Law of Hypothec works as much in favour of the tenant as the landlord. We believe this to be the case in some instances; but we have no hesitation in adopting Mr. Hope's (Fenton Barns) suggestion, that it is by a collusion, that in other cases—in England at least—would be called a *conspiracy*, and subject both parties to a trial at the Old Bailey. We have, in fact, known two similar cases, in which, to avoid a prosecution, the guilty parties were compelled to refund, it being proved that the goods were purchased for the express purpose of paying the proceeds over to the other creditor; and this appears to have been the case with the landlords and tenants referred to by Mr. Hope.

We trust that this movement will not be allowed to die away, but that the intention of the Lord Advocate to introduce the subject into the House of Commons will have the effect of bringing about either an equitable modification of the law or its total abolition.

CATTLE IMPORTATION AND DISEASE BILLS.

The Committee of the House of Commons met to take evidence on Tuesday, May 10, all the members being present, and Mr. BRUCE presiding.

The first witness called was

Mr. JOHN GAMGEE, who, in answer to questions, spoke of the loss sustained in Dublin by the importation of diseased cattle from England, something like £1,158 a-year representing the difference of price between healthy and diseased cattle, upon a sale of 181 infected animals. There was not a spot in the United Kingdom where cattle were so steeped in disease as Cheshire, in consequence of the connection with the Liverpool markets. The manner in which cows were kept unquestionably affected the state of the disease; and with regard to pleuro-pneumonia, or lung disease, the condition of cattle suffering from that cause was more favourable in well-managed dairies than in the country, owing, in a great extent, to their being kept warmer in towns. Taking a given number of cows, there was no doubt more disease in towns than in the country, because the stock was constantly changing; but the loss would be greater in the country. The number of diseased cattle imported into this country was increasing very largely, but it was impossible to state the exact proportion they bore to the healthy importations. He never saw cattle imported diseased from Spain or Brittany, but he had seen them diseased after they had been kept here a week or two. The country that furnished us with the greatest amount of disease at the present time was Prussia. Holland used to be the country. Prior to the British ports being opened, Friesland and all the northern Provinces of Holland were perfectly free from contagious disease; but the moment our ports were opened, their supply was so reduced that it was no longer equal to their own wants: they had to make up from the eastward what they exported westward, and thus the disease was carried. The largest amount of disease was now found in the ports of exportation, where the dealers were buying, and the districts nearest to those ports were those that suffered most. The Continent of Europe had suffered more severely than the islands of Europe, the islands having been principally exporters; and formerly Great Britain and Ireland had been no exception to that rule, but now the losses here were fully equal to those in any part of the Continent. The Continental States had protected us to a large extent, especially with regard to the Russian plague, from which nothing could have saved us but the rigid quarantine enforced upon the Austro-Russian and Prussian frontiers. Lung disease and smallpox in sheep were constantly met with in Russia, and in some districts of Prussia, and came through Rotterdam and Hamburg to England. Smallpox was about stationary in Prussia: the disease was not imported, but was reproduced by the farmers on the Polish frontier inoculating their sheep. It was as much foreign to Prussia as to Britain. There was more disease in Ireland, and consequently we imported more from thence than from elsewhere. No doubt there was great loss in Ireland from the poverty of the districts, and he did not believe that Irish cattle were more susceptible of lung disease than English or Scotch cattle. He had seen at Waterford recently three diseased cows ready for embarkation for Wales or Bristol, and he had frequently seen large quantities of cattle from Ireland suffering from pleuro-pneumonia on their arrival. Either Scotch

Irish, or English stock was healthy alone, the average mortality being 5 per cent. in Scotland, 17 in Ireland, and 6 in England. There was no material change in the amount of lung disease. There were measures by which it could be to a great extent checked, and the plan he had adopted was to separate the diseased animals from the rest of the stock—a most useful measure in all contagious disorders—and to give the healthy stock sulphate of iron to strengthen them against disease. He had often found it necessary to kill cattle affected with pleuro-pneumonia; the disease was highly contagious, and was, he believed, so much propagated by apparently healthy animals as by those which were visibly diseased. If he were sent for to a farm where a good number of cattle were suffering from pleuro-pneumonia, he should inoculate the whole number, and those which had actually taken the disease he would feed well; he had found that medicines generally did more harm than good. Under his plan, about 50 per cent. would recover. He objected to the removal of animals that were diseased, because in that way the evil was spread; it was better, if they had to be killed, to kill them upon the spot. He had seen diseased animals on railways, placed amongst a number of healthy ones, and he had seen trucks full of healthy cattle with diseased cattle in front of them. The waggons used for the conveyance of cattle were, as a rule, well suited to the purpose. Healthy cattle standing in the straw upon which diseased cattle had been travelling would be likely to take the disorder; but the contagious element of pleuro-pneumonia did not, in his opinion, remain long in the trucks. The best cleansing agent was water. When cows were inoculated, the disease was nothing like so violent as when taken naturally; and, in fact, he knew many instances in which not a single drop of milk was lost by the process. Cattle affected with pleuro-pneumonia were constantly sold with a quantity of healthy cattle, and were taken to market with them. The removal ought to be insisted upon, where there were no means of separation; but in country farms it was better to leave the unsound animal where it was. The object was to secure the best separation with the least possible disturbance of the stock. He had no doubt that the slaughtering of animals with pleuro-pneumonia caused disease amongst those who ate the meat. When an animal was killed having the disease, the meat was probed: it had not the juicy appearance and feeling of healthy meat. In the early stages of the disease, the lung increased in weight, and this went on till in some cases it reached a weight of 50 lb. When the disease was so far advanced as that, the nutriment of the meat was altogether lost; the nutriment was proportionate to the progress of the disorder. The disease varied in the time it lasted; in some cases death was caused in three or four days, and in others the disorder went on for three or four months. He had had opportunities of seeing a great deal of dead meat in all parts of the kingdom. The rule was to eat the meat of cattle that had suffered from pleuro-pneumonia, probably not more than one in five hundred being otherwise disposed of. He had not had an opportunity of tracing the effect on the human body of the consumption of meat so affected, but he had not the slightest doubt that it was most injurious. The authorities at Edinburgh had not taken measures to check the sale of diseased animals, though the market clerk had expressed a desire that the diseased should

be separated as far as practicable from healthy cattle. As to the dead meat, there were many of opinion that the flesh of cattle that had suffered from lung disease was not injurious, but he did not mean to imply that the authorities in Edinburgh in any way connived at the sale of diseased meat. There was a large quantity of diseased meat affected with pleuro-pneumonia brought into the London market. Pleuro-pneumonia might go on for a week or two before being noticed. The loss from mouth disease was also very great. In those cases removal propagated the disease, and often involved serious damage to the farmer, so that he had generally ordered that the affected animals should be separated from the others, and an attempt made to cure them before they were removed. When the disease appeared it was extremely wrong to allow the stock to be sold; but it frequently appeared in the transit from one place to another, and all that could be done in that case was to separate the stock as much as possible, and to use some lotion to kill the virus as it came out. As a rule, the separation in the markets was perfectly practicable with a little management, and there should also be separation in the droves where practicable. At the Islington market, he saw on Sunday a large quantity of perfectly healthy cattle so placed that if they were not sold on the Monday nothing could save them from infection. In the case of cows there was a falling off of the milk from mouth disease, till the animals became comparatively valueless; and when the eruption came out on the teats, which was one of the results of the disease, there was no doubt the mouth disease was communicated to persons who consumed the milk. He had known cases of whole families suffering from that cause, the symptoms being sore mouths, diarrhoea in the case of children, and often very obstinate eruptions all over the limbs. The disease was not, in his opinion, communicated from milk itself, but through the virus that got into the milk. He was not prepared to say that in the dairies of London there was a great amount of this disease, and he had no doubt that it could be, and was to a great extent, checked by cleanliness and proper care. One precaution was to wash the hands after milking each cow. He believed that, speaking generally, the flesh of the animals having mouth disease would not affect the consumer of it, though there were no doubt cases where diarrhoea and other ill effects had followed. Anthrax had not varied very much in this country, and it was not, in fact, a contagious disease. There were cases of loss of life from carbuncle, taken by persons from cattle affected with the disease. Smallpox in sheep was a very rare disease here, and he was not aware that it existed to any great extent at this time. The proper way to prevent the spread of the disease, which was highly contagious, was to prohibit the infected animals being sold for store sheep. This disease was communicated to a distance of 300 or 400 yards. He had taken precautions against the removal of animals affected with it. Scab in sheep was easily prevented, and easily cured. It was often caught from railway trucks. Enormous numbers of sheep were killed by the mercurial dressing used in these cases; and he had known contracts for the killing and sale of animals poisoned by the mercury to be brought to the London market for human food. Sheep with scab only produced unwholesome meat where there was mercury present; for where mercury was used it was very difficult to drive it out of the system. He recommended in these cases tobacco, hellebore, and preparations of tar. Mercurial ointment was very objectionable, and often fatal. Diseases of pigs were the most malignant and fatal of all, in their effect upon the human frame. That which was best known was the so-

called measles, which produced in the human body the tape-worm; and the prevalence of tape-worm in the manufacturing districts, where large quantities of pork, and especially Irish pork, were consumed, confirmed this. English and Scotch pigs were almost free from this disease. It was not a contagious disease. There were other diseases of pigs, from parasites upon the lungs, heart, and kidneys; and there was a direct connection between the presence of these forms in the human body and in the lower animals killed for human food. These parasites could only be destroyed by a very high temperature—ordinary cooking would not get rid of them. Very large quantities of diseased pigs were sold, and in Ireland particularly people knew very well what they were buying, and claimed a reduction of price in consequence of the pork being mealy. In his opinion, the best means of disposing of meat that was condemned was to dress it at once with carbonic acid, so as to prevent the possibility of its being used for human food, and then to send it where the different parts of the animal might be made use of for the purpose of manure. It was very difficult to get the flesh of any animal altogether free from parasites, and he should recommend therefore that it should be insisted that no pig should be fed upon uncooked flesh, and that such as was given should always be mixed with vegetables.

In reply to Lord Naas, Mr. GAMGER stated that, in his opinion, though some farmers now took measures to check pleuro-pneumonia, and with success, the amount of disease and its character were much the same as for some time past. In this and many other diseases, including smallpox in sheep, attention must be turned to prevention rather than to remedying the disease after it appeared. If healthy stock could be kept perfectly shut off from the outer world, pleuro-pneumonia would never appear; and in a case which had come under his observation, one of the best shorthorn breeders in Scotland found, to his surprise, an appearance of the disease with some of his stock which had before been in a most healthy condition, and which had been kept from contact with other cattle; but the explanation was furnished by some one having turned infected cattle upon a neighbouring field. The disease was usually communicated by inhaling the breath of infected animals; but it was also in some cases communicated by touch. Pleuro-pneumonia, as a rule, was easily distinguished in its earliest stages from other affections of the lungs, chiefly by the grunt, which was its invariable accompaniment. He recommended the animal being killed in the earliest stage of the disease, when its condition would scarcely have begun to deteriorate, and sent to market, for he believed it to be then fit for human food. But one of the great hardships of the consumer was that the meat of an animal which had been affected with the disorder in its worst stage looked beautiful, and no mere examination of the meat would enable anyone to detect the disease. The most stringent system for prohibiting the sale of diseased animals was the best, and would, in the end, involve the smallest amount of loss; and until something of the kind was done, they would not get farmers generally to adopt preventive measures. Perhaps there was as great a spread of disease from moving about in railways, from one part of the country to another, as in bringing the animals by steamer from Scotland and Ireland, and the precautionary measures taken in the one case should be equally afforded in the other. Rapid railway travelling was, in his opinion, greatly conducive to the communication of infectious disease. The cure of mouth disease was a matter of a very short time—seven days, or even less, if proper treatment was resorted to; but nothing could be worse than their immediate removal, which was too frequently the course taken. In the same way it was

etter to take one diseased animal from a railway truck upon its journey, rather than that the whole should be infected, and there would be less loss upon that one animal when it came to the market. Washing the feet of sheep, in the case of mouth disease—a most necessary precaution—might, in his opinion, be required, and the arrangements for the purpose might be provided without difficulty. The best cattle went over from Liverpool to Dublin and Cork, but it was the treatment in their transit and when they arrived that destroyed them. The system of inspection of diseased meat in this country was very bad; but the mere examination of dead meat would never check the evil, without proper inspection and preventive measures as regarded the live cattle. He could prohibit positively the sale of the carcase of any animal which had died with pleuro-pneumonia, unless an inspection before death proved that the disease was only in its earliest stage.

At this stage the committee adjourned until Friday.

The Select Committee reassembled on Friday, and Mr Langge's evidence was proceeded with.

In answer to questions from Mr. Caird and Mr. Hodgkinson Mr. GAMGEE repeated his statement that there was not proper supervision of the slaughterhouses in Edinburgh—only a small proportion of the diseased cattle being condemned. With regard to the large towns the ordinary practice was to milk the cows as long as they could be kept on, and they were usually sent away within the year. Diseased cows with pleuro-pneumonia would generally die in five months. He had known cases in Glasgow where diseased cows were purposely bred from, because a higher price was paid for those that had had the disease. It was almost impossible to buy cattle in the market at Glasgow without taking pleuro-pneumonia home. He would recommend inoculation in large dairies as the best remedy for the evil; and the objections which had been raised against the practice were entirely consequent upon the clumsy performance of the operation. He had practised inoculation extensively in farms of 100 and 150 animals, and in dairies in Glasgow of an equal extent, with only one case of failure. In one of the large dairies of Edinburgh he had inoculated, and the cattle had been in an irreproachable condition ever since. His experience was that pleuro-pneumonia was only taken once, except in very rare cases, and inoculation was in his opinion the most effectual preventive. One of the hardships in the spread of this disease was that it was not difficult of prevention; for, besides inoculation, careful separation and treatment with mineral tonics was generally successful. If, in all cases, the presence of the disease was detected at an early stage, and proper preventive measures were taken, the mortality would be reduced to a fraction per cent. of its present amount. An animal affected by the disease, wherever found, should be killed; but in the early stage of the disease the meat might be eaten without danger. The object in all these cases of contagious disorders was rather to limit the area of the disease than to cure animals affected by the disease; but he should not certainly recommend that any power should be given to enter upon a farm and destroy any number of animals. In the mouth disease it often happened that a fat ox was reduced in value in three days by £4, and it lost 50 or 60 lbs. in weight, which loss fell most heavily upon the farmer. The disease was rapidly spread by contagion, and he would recommend that animals affected with it should be separated from the rest, and not allowed to go into the store market at all. He had seen in the markets here 1,000 head of cattle affected by the disease, and yet nothing was done; but if proper cleanliness was observed, and the diseased animals were separated from

the others, much good would be done. An animal was perhaps brought to the market in such a bad state, that no one would buy it, and at the next market healthy cattle would be placed in the same layers. Tobacco juice was a very good remedy for scab in sheep, and he had seen it successfully applied; but tobacco was so much adulterated, that the quantity of useful price varied, and the results upon the sheep of course varied also. But they were not limited to tobacco—there were other preparations equally efficacious. Pleuro-pneumonia was communicated from one truck in advance of others, and the corrective in that case was to stop the diseased animals before they reached the railway. He had no doubt that a great deal of meat was brought to the suburbs of London that did not go through the markets at all. The insurance offices increased the spread of disease by insisting upon the sale of the diseased animals. There was strong proof that parasitic disorders were communicated after the animal had been removed from the local causes to which the disease was due. There was an impression in the country that there was nothing to be done with a diseased animal but to cut its throat, and that impression required to be corrected. In the application of mercury to sheep, his opinion was that the number of deaths to which he had alluded in his former evidence was caused by the ointment, and not from damp or cold at the time of the application.

Replying to Mr. Hunt,

Mr. GAMGEE explained the regulations in force on the continent to prevent the sale of meat unfit for human food and to prevent the spread of disease. With the former of these objects there were in Belgium public slaughter-houses with inspectors to attend to the admission of stock. Large cities like Brussels had magnificent slaughterhouses, and the inspectors there took great care to watch all the animals as they passed in; the whole of the stock was carefully housed and fed, and if a diseased animal should find its way in, it was put aside to be killed for manure; in Antwerp it would be sent to the Zoological Gardens. In those cases the whole of the loss fell upon the owner; but if there was any salvage, he, of course, would get the benefit of it. People knew that they must not send diseased cattle to the market, and the consequence was that out of 500 cattle brought in he had only seen the inspector's mark upon one. Diseased cattle was not sent to the slaughterhouse, and diseased meat was not sent in consequence to the dead-meat market. Such regulations had been in force all over the continent. He was not aware that any complaint was made with respect to the stringency of the regulations; on the contrary, stock-holders did everything to aid the Government, knowing that the interference to which they were subjected was the salvation of their stock. In Austria, diseased animals were separated from the rest after careful inspection; there were prohibitive regulations for some disorders, but others were marked and allowed them to be sold in a particular market. In France the regulations were such that no dead meat could go into Paris without passing an inspector. No animal could be slaughtered for human food except in a recognised slaughterhouse, and after that it had to pass an inspector. The owner of a condemned animal was allowed to call in a veterinary surgeon to pronounce an opinion upon the decision of the Government inspector. No meat could be exposed for sale in Paris that had not been fed for six weeks after birth. In Prussia, Belgium, France, Austria, and in some parts of Italy there was an efficient frontier inspection to prevent diseased cattle being brought into the country. In Prussia, diseased foreign cattle were prevented from crossing the frontier, and in the case of cattle coming from places where contagious

disorders were prevalent, they were subjected to quarantine. There was a regular inspector of fairs and markets in Austria and Prussia. Both in Prussia and France there were inspectors all over the country, who attended markets and fairs and reported upon the outbreak of disease wherever they might find it, and diseased animals being sent to market were at once stopped, and the spread of the contagion was checked. In France a warranty extending over nine days was given to the butcher with regard to those diseases which at the time of purchase could not be detected.

In answer to Lord Naas: He thought it would be most desirable to have a similar warranty here, especially with regard to lung disease, in which case the warranty should cover three weeks for store cattle.

Lord NAAS: Could you adopt the continental system here without a central organisation under the control of the Government, guided by scientific and experienced men to carry out the necessary regulations?

Mr. GAMGEE: Judging from the experience of the medical officers of health, I should say it could be done. When cattle was sent by railway trucks, it was well as a preventive of mouth disease to have the trucks carefully washed with lime, in case others with the disease should have previously travelled led in the same carriages.

Replying to Mr. COX,

Mr. GAMGEE said: It was quite impossible to state the quantity of dead meat coming into London. There were far too many slaughterhouses in the city of London. He would

do away with private slaughterhouses altogether, and, following the continental system, establish a small number of large public slaughterhouses. The large amount of disease existing in Prussia, notwithstanding the precautions taken and the regulations in force, was due to proximity to the plague-breeding districts. In the case of a flock of 500 or 600 sheep purchased in different parts and intended to be carried to several markets, if at the first market-town fifty were found infected with mouth disease, he would certainly stop the whole flock. So with cattle suffering from pleuro-pneumonia, he would stop them wherever the disease appeared; and assuming that there were a large number of cattle coming by rail to the London market, and it was found during the journey that one or two animals were affected with pleuro-pneumonia, he would remove the trucks in which the diseased animals were, and allow the rest to go on.

To Colonel BARTELOT the witness admitted that boiling the milk might be effectual in some cases in preventing human beings from being infected with mouth disease; but added that he had heard of cases where children had taken mouth disease from batter-pudding.

In reply to Lord NAAS: He promised to send in statistics with respect to the diseases of animals in Mecklenburg, Bavaria, Holland, and Prussia.

The Committee then adjourned to Tuesday the 24th inst., when evidence will be taken as to the effect of diseased meat upon the human frame.

BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

The usual monthly meeting of the council was held at the Railway Hotel, Taunton, on May 7th, under the presidency of Earl Fortescue. There were also present Sir J. T. B. Duckworth, Colonels Archer and Luttrell, Drs. Brent, Gillett, and Scott, Rev. T. Phillpotts, Messrs. C. and R. H. Bush, T. Danger, E. S. Drewe, M. Farrant, J. Fry, C. Gordon, John and Jonathan Gray, H. P. Jones, J. E. Koollis, J. Lush, R. May, S. Pitman, G. S. Poole, J. Sillifant, E. U. Vidal, H. St. John Maule, and J. Goodwin.

TELEGRAPHIC COMMUNICATION WITH THE SHOW-YARD AT BRISTOL.—An offer on the part of the British and Irish Magnetic Telegraph Company to connect the show-yard with their general system of telegraphs was referred to Messrs. John and Jonathan Gray, in order to their taking such steps as they may think desirable for the interests of the society and the convenience of exhibitors.

THE ART UNION.—A communication from Mr. R. R. M. Daw, honorary secretary of the arts' department, relating to an interchange of advantages between the Bristol Art Union and the Art Union in connection with the Bath and West of England Society, having been read, a discussion ensued, in the course of which a desire was universally expressed to give every facility for carrying out the proposed friendly arrangements between the two bodies, and a resolution in accordance with this view was unanimously passed.

THE FINANCE COMMITTEE brought up their quarterly statement of accounts, and in the course of a discussion which incidentally arose as to the propriety of expending a sum of money for the purpose of making the new arts' building in all respects efficient and secure, it was stated that ten years ago

the society only distributed £370 in prizes for stock, whereas at the Bristol meeting the prizes would amount to nearly £1,200—a proof, as it was stated by a member of council, that, in developing the arts' department, every care had been taken to promote the other objects, and especially the successful breeding of stock, for which the society was primarily instituted.

THE MEETING OF 1865.—CONSTITUTION OF THE SOCIETY.—Mr. POOLE said, as the Royal Agricultural Society of England had resolved to visit Plymouth in the year 1865, it appeared to be the wish of the council of the Bath and West of England Society that they should go as far out of the way of the Royal as they possibly could, so as not in any way to interfere with the success of the great national exhibition. In order to enable them to do this, however, it would be necessary to alter or suspend those rules of the society which, among other things, divided the area of their operations into an eastern and a western division, and required that the annual meetings for exhibitions should be held in different towns in successive years alternately in each district. With this view he formally handed in a series of resolutions which he should move at the next annual meeting.

At this stage of the proceedings the following communication, from the mayor and authorities of the city of Hereford, was read:—

St. John's-street, Hereford, 5th May, 1864.

DEAR SIR.—We are directed by the mayor of Hereford to invite the council of the Bath and West of England Society to hold their annual meeting in 1865 at the city of Hereford. A copy of the resolutions passed at a meeting held on Wednesday, the 4th May, 1864, is sent herewith.

We are also directed to state that the required amount, viz., £900, shall be duly paid to your bankers.

We beg to inform you that the requisite sites for holding the show, for trial-ground for implements, &c., will be ready for inspection at any time; and we shall feel obliged by your letting us know when we may have the honour of seeing the deputation from your council to view the same.

Should your council determine upon holding their meeting in this city in 1865, we trust that our arrangements will be found satisfactory.

We remain, &c.,
 J. T. OWEN FOWLER } Hon. Secs.
 THOMAS DUCKHAM }

To H. St. John Maule, Esq.

The proposal contained in this invitation was very cordially received, but after considerable discussion it was held that no formal decision could be arrived at till the annual meeting had affirmed the propriety of the changes contemplated by Mr. Poole, in the motion of which he had given notice. A deputation, however, was appointed to visit Hereford on the 19th inst. for the purposes mentioned in the invitation.

THE PROGRAMME OF THE BRISTOL MEETING was brought up and confirmed. The open judging of stock and poultry will commence at 10 o'clock on the morning of Monday, 13th June; the implement and arts departments will open at the same hour; the horticultural department will open at 1 o'clock. On the other days all departments will open at 9 a.m., and close at 6 p.m. Of the trial of steam-ploughs, &c., full information will hereafter be announced. A new and interesting feature will be the ring or circle, in which the horses will be paraded for at least half-an-hour at 12 o'clock and 4 o'clock daily. The shoeing of horses will commence at 10 o'clock on Wednesday, at portable forges in the yard. The annual banquet will take place on Wednesday, under the presidency of Earl Fortescue; the chair to be taken at 5 p.m., instead of 4 p.m., as formerly. The bands of the Grenadier Guards and the Royal Marines from Plymouth have been engaged, and on Wednesday afternoon they will play concerted pieces as they did last year, with so much satisfaction, at Exeter.

MEMBERS OF COUNCIL FOR THE YEAR 1864-5.—The council resolved, provisionally, to recommend to the annual meeting the election of a number of gentlemen, including Mr. J. W. Miles, of Kingweston, Bristol; Mr. Bates, of Bristol; and Mr. T. Duckham, of Herefordshire, to supply the places of members of council who go out of office by rotation in June next.

NEW MEMBERS.—Mr. R. Davey, M.P., Cerwall; Rev. H. Milward, Paulton Vicarage; Major Brydges Williams, Cornwall; Mr. W. R. Hicks, Bodmin; Mr. A. B. Saville, Bristol Bank; Mr. H. Granger, Henbury; Mr. J. Wills, Hampnett; Mr. W. Woodward, Northway-house, Ashchurch; Mr. S. Lang, Bristol; Mr. E. Fraeman, Manchester; Mr. W. Titley, Bath; Mr. J. Stone, 16, George-street, Mansion-house; Mr. E. A. Fawcett, St. Albans; Mr. A. R. Boughton Knight, Ludlow; Mr. J. Tremayne, Heligan, St. Austell; Rev. J. Wrey, Teignmouth.

On May 19th the deputation appointed by the Council of the Bath and West of England Society visited Hereford, for the purpose of inspecting the land selected by the local committee for the meeting of the society in Hereford

in the year '65. The deputation comprised Mr. E. J. Drewe, Mr. Gray, Rev. T. Philpott (Truro), Mr. J. E. Knollys, Mr. G. Pitman, Mr. John Gray (King Weston), Mr. J. H. Cotterell (Bath), and Mr. Henry St. John Maule (Bath).

The members of the local committee who met the above gentlemen were Colonel Clifford, M.P., Mr. F. L. Bodenham, Mr. C. Anthony, Mr. J. Jay, Mr. W. Pulling, Mr. John Bosley (Lyde), Mr. William Taylor (Thingebill), Mr. T. Pitt (Freetown), Mr. J. Bennett (Ingestone), and the hon. secretaries, Messrs. Fowler and Duckham.

The deputation having visited the site and examined the approaches from the different railway stations, together with the facilities offered for the accommodation and entertainment of the society, returned to the Green Dragon, when, after a brief consultation, they summoned the secretaries, and such members of the local committee as were in waiting, to their presence, when Mr. Drewe, who officiated as chairman, rose to address them, and expressed the pleasure the deputation felt in responding to the invitation which had been sent to their Council, and the cordial reception which they, as a body, had experienced upon their arrival at Hereford. He stated that, although the site offered for the show was not quite in the most desirable form, yet he believed it would be adequate for the purposes of the society. At the same time, whilst he expressed those sentiments, he considered that they would prefer a form of yard more approximating a square, and that such a form could be obtained by an expenditure in draining and levelling an adjoining field. But from the liberal manner in which the local committee had met the requirements of the society, and the admirable arrangements made for the land for the trials of implements, machinery, &c., which he had no hesitation in stating were the best and most complete the society had ever had offered them, the deputation were unwilling to cause any increase of expenditure, beyond what was considered absolutely necessary for their purpose. Therefore, although they were fully aware if it was so arranged the effect of the show-yard would be much more complete, yet they would leave it entirely in the hands of the committee whether the suggestion should be carried out or not. He then drew the special attention of the committee to the importance of making, or aid in making, arrangements with the different railway companies for the conveyance and delivery of stock, implements, &c., to the show-yard. Mr. Duckham having briefly replied, signed the requirements of the society on behalf of the local committee; after which the committee invited the deputation to dinner, when Mr. Bodenham (in the unavoidable absence of the mayor) ably presided, and the warm expression of gratification entertained at the probable visit of the society on the one hand, and the cordial and hospitable manner in which the deputation had been received on the other, formed the theme of conversation, and caused each to feel the more earnest in promoting the full success of their next year's visit, when it is hoped there will be a renewal of the acquaintance which had that day so happily commenced.—*Hereford Times.*

THE GENERAL MEETING OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The annual meeting of the members of the Royal Agricultural Society of England took place at noon May 24. Lord Faversham presided.

The Secretary having read the bye-law relating to the Election of the Council, the election was proceeded with in the ordinary manner, and after the lapse of a few minutes the scrutineers announced that the following House List had been adopted: C. E. Amos, Cedar's Road, Clapham Common; J. H. Arkwright, Hampton Court, Leominster; N. G. Barthropp, Hacheston, Wickham Market, Suffolk; E. Bowly, Siddington, Cirencester; Lord Chesham, Latimers, Chesham; Joseph Druce, Eynsham; Earl Fortescue, Castle Hill, Southmolton; B. T. B. Gibbs, Halfmoon Street, Piccadilly; E. Holland, M.P., Dumbleton Hall, Evesham; C. W. Hoekyns, Harewood, Ross; W. Hutton, Gate Burton, Gainsboro'; S. Jonas, Chrishall Grange, Saffron Walden; Sir E. C. Kerrison, Bart., M.P., Brome Hall, Seale; J. B. Lawes, Rothamsted, St. Albans; C. Lawrence, Cirencester; Lord Leigh, Stonelagh Abbey, Warwickshire; Sir Archibald K. Macdonald, Bart., Woolmer Lodge, Liphook; C. Randall, Chadbury, Wrexham; W. Searay, Holmsparreput, Netts; Earl of Shrewsbury and Talbot, Ingestre Hall, Stafford; J. Shuttleworth, Hartsholme Hall, Lincoln; R. Smith, Emmett's Grange, Southmolton; Colonel Towneley, Towneley Park, Blackburn; Lord Tredegar, Tredegar, Newport, Monmouthshire; W. Wells, Holmswood, Peterboro'.

Lord PORTMAN then said he had to propose that Sir Edward Kerrison, M.P., be the President of the Society for the ensuing year. It was the sense of the Council that there should be a member of the House of Commons at the head of the Society for the next year, and he believed the meeting would concur in that view. It was some years since a member of the Lower House was the President, the last instance of the kind being that of the present Speaker, who was elected to that high office. During the time of his presidency Sir Edward Kerrison had served the Society most ably and actively, while another reason for electing him was that as the Society was now going to the extreme west, it was desirable to show that there was some wisdom in the east, with which Sir Edward was connected (Cheers and laughter).

Mr. FISHER HOBBS, in seconding the resolution, said there was no one more popular among agriculturists in the east than Sir Edward Kerrison, and he believed that his appointment to the office of President would be universally approved.

The motion was then passed unanimously.

The Trustees and Vice-Presidents having been re-elected,

The Secretary (Mr. Hall Dare) read the report of the Council, which was as follows:

REPORT OF THE COUNCIL.

The Council have the gratification of announcing that, since the last general meeting in December, His Royal Highness the Prince of Wales has allowed his name to be enrolled in the list of your governors.

During the past five months the names of five governors and 138 members have been removed from the list by death and retirement, while one governor and 232 members have been elected, so that the Society now consists of

78 Life Governors.
45 Annual "
1849 Life Members.
4013 Annual "
17 Honorary "

Making a total of 6496, being an increase of 53 names.

The Council have elected Major-General the Hon. Alexander Nelson Hood as a Vice-President, in the room of Lord Ashburton, deceased.

The half-yearly statement of accounts to the 31st December, 1863, has been examined and approved by the auditors and accountants of the Society, and together with the balance sheet for the whole year 1863, and a statement of the country meeting account for Worcester, has been published in the last number of the Journal. The funded capital stands at £16,488 17s. 10d. in the New Three per Cents., £3000 has been placed on deposit at interest with the Society's bankers, and the current cash balance in their hands on the 1st inst. was £2836 6s. 6d.

Papers have been read at the weekly meetings by Mr. Lawes, on "Salt used as a Manure;" by Mr. Hughes, on "The Cultivation and Management of Clay Farms;" by Mr. Holland, M.P., on "Agricultural Education;" and by Professor Voelcker, on "Nutrition of Plants by the Atmosphere."

A committee has been appointed to consider the measures which ought to be taken for the improvement of the education of those who depend upon the cultivation of the soil for their support, this being declared by the Charter as the seventh national object to be prosecuted by the Society.

The Lords Commissioners of Her Majesty's Treasury having applied to the Society for assistance in carrying out their design of presenting some sheep to the Viceroy of Egypt, who is anxious to improve his native breeds by crossing, a selection was made under the direction of the President; and a communication has been received of the safe arrival of the sheep at Cairo.

A special committee having been appointed to consider the question of the dates of calving, the Council have approved of their recommendation, that any alteration in the date of calving would be inconvenient and thus undesirable.

The arrangements for the Newcastle Meeting, to be held during the week commencing Monday the 18th July, are proceeding satisfactorily. The showyard will be open as under:—

	s.	d.
Monday.....	10	0
Tuesday.....	2	6
Wednesday.....	3	6
Thursday.....	1	0
Friday.....	1	0

The Council have determined that the Annual Country Meeting in 1865 shall be held at Plymouth.

The district for the Country Meeting of 1866 will include the counties of Cambridgeshire, Essex, Hertfordshire, Huntingdonshire, Norfolk, and Suffolk.

By order of the Council,

H. HALL DARE, Secretary.

On the motion of Mr. Childers, seconded by Mr. Sutton Weston, the report was adopted.

Lord WALSINGHAM moved a vote of thanks to the auditors, and testified from observation to the effective manner in which they discharged their duties.

Mr. CLUTTON seconded the motion, which was adopted unanimously.

Mr. ASTBURY, as one of the auditors, briefly returned thanks.

The agenda paper having been thus gone through,

The CHAIRMAN inquired whether any member had any suggestion to make to the council.

Mr. DENT, M.P., said he thought it desirable that the list of persons willing to act as judges at the approaching show could be increased. In the case of the Leicesters, short-corns, and horses there was a pretty good list, but in some other cases there would, he feared, be great difficulty in selecting a sufficient number of persons competent to act as judges.

Mr. FISHER HOBBS agreed with Mr. Dent on this point, and hoped that many more qualified persons would be induced to offer their services.

In reply to Mr. R. BARKER,

Mr. FISHER HOBBS said the list of judges would remain open until the 1st of June.

Mr. BEALE BROWNE congratulated the meeting on the new regulation with regard to the clipping of sheep. He also advocated the establishment of voting by proxy for the council, and a complete representation of the whole country in the Council.

On the motion of Mr. CALDWELL, seconded by Mr. DENT, M.P., a vote of thanks was awarded to the noble lord in the Chair.

The CHAIRMAN, after acknowledging the vote, adverted to the discussion which took place, after the ordinary business had been disposed of, at the meeting in December last. Mr. Sidney complained on that occasion, he said, that the Editor of the *Journal* wrote too much for it himself; but the Council had no reason to suppose that that was the general opinion of

the meeting. Mr. Sidney also complained that that building was quite inadequate to the purposes of the society, and suggested that there should be a library, containing books of reference on agricultural subjects, a museum, and a laboratory, provided out of the invested fund of the Society. That fund amounted only to £16,500, and the Council after considering the matter did not deem it expedient to incur the expense of the proposed additions. As regarded the 7th object mentioned in the charter, relating to the education of those who were engaged in the cultivation of the soil—a subject which was introduced in December by Mr. Morton—he would observe that Mr. Holland introduced the question of education at a meeting held in April, and it was now under the consideration of a committee. In compliance with a suggestion of Mr. Duckham, the Council would endeavour to facilitate the return of the stock as early as possible after the show. As regarded the suggestion of the same gentleman, that arrangements should be made for securing that the dates of calving should always be the same, he wished to state that the Council had come to a unanimous resolution that it was not advisable for that society to make any alteration. In conclusion, he denied that the Council deserved the imputation of being a stand-still body, and said that they were always desirous of pursuing an onward course and carrying out all the objects of the founders, their proceedings being all based on the principle of "Practice with Science" (cheers.)

The meeting then separated.

MIDLAND COUNTIES ANTI-MALT-TAX ASSOCIATION.

A large and influential meeting of the members of this association was held on May 14, at the Three Crowns Hotel, Leicester. The delegates present were, from Leicestershire: Messrs. R. H. Chapman, Upton; J. Gardner, Twycross; B. Walker, Odstone; William Wright, Shoby; Warren Sherman, Melton; G. O. Smith, Stoughton; W. Miles, Leicester; W. Inett, Afordby; J. Toone, Highcross; Francis Spencer, Claybrook, Letterworth; Robert Carver, Ingaraby, Leicester; Thomas Wilson, Knaptoft, Rugby; Thomas Henton Simpkin, Hoby, Leicester; Charles Bosworth, Dishley Grange, Leicestershire; R. Fulshaw Bushby.—Staffordshire: Messrs. H. Osborne, Weeford Park, Tamworth; Thomas Neville, Shenstone; Robert Brown, Wiggington House, Tamworth; Thomas Parr, Alrewas, Tamworth; George A. May, Elford Park, Tamworth; R. H. Masfen, Pendeford, Wolverhampton.—Warwickshire: Messrs. Edward Umbers, Wappenbury, Leamington; John Dormer, Duntun, Coleshill; Samuel Umbers, Wappenbury, Leamington; Wm. Grundy, Austrey, Warwickshire.—Derbyshire: Messrs. James Nuttall, Chaddeaden, Derby; John Canner, Stanley Grange, Derby; Richard Gibson, Swarkstone Lowes.—Nottinghamshire: Messrs. George Storer, Thornton Hall, Bingham, Notts; John Sampey, Hawton Grange, Newark.—Northampton: Mr. Matthew Oldacres, Clipstone.

The chair was taken by Mr. GEORGE STORER, of Thornton Hall, Bingham.

The following resolutions were adopted:

"That the counties of Derby, Lincoln, Northampton, Nottingham, Worcester, Warwick, Rutland, Hereford, Leicester, Salop, and Stafford form the Midland Counties Anti-Malt-Tax Association."

Carried unanimously.

"That a committee of not less than six gentlemen be formed in each electoral division of the said counties to carry out the

objects of this association, and that the following gentlemen be correspondents for such local committees:

DERBYSHIRE.—Mr. John Canner, Stanley Grange, Derby.
LINCOLNSHIRE (North).—Mr. Joseph Kirkham, Audley Villa, Lincoln. (South) Mr. T. C. Beasley, Harston, Grantham.

NORTHAMPTONSHIRE.—Mr. Matthew Oldacres, Clipstone, Northampton.

NOTTINGHAMSHIRE (North).—Mr. Edward Hodgkinson, Styrrup, Tickhill, Rotherham. (South) Mr. G. Storer, Thornton, Bingham.

WORCESTERSHIRE (East).—Mr. H. Laking, The Link, Malvern. (West) Mr. James Baldwin, Kings Norton.

WARWICKSHIRE (North).—Mr. John Dormer, Duntun Hall, Coleshill. (South) Mr. Edward Umbers, Wappenbury, Leamington.

RUTLAND.—Mr. B. Painter, Burley, Oakham.

HEREFORDSHIRE.—Mr. T. S. Duckham, Bayham Court, Ross.

LEICESTERSHIRE (North).—Mr. Robt. Carver, Ingaraby. (South) Mr. R. H. Chapman, Upton, Nuneaton.

SALOP.—Mr. John Meire, Brockton, Shifnell.

STAFFORDSHIRE (North).—Mr. G. A. May, Elford Park, Tamworth. (South) Mr. R. H. Masfen, Pendeford, Wolverhampton.

"That each branch committee ascertain before the next general meeting what are the views of the sitting members for their county as regards the repeal of the malt-tax, and report thereon."

"That this meeting pledges itself to exert its entire influence irrespective of party considerations, to secure at any future elections the return of such representatives in Parliament only as will pledge themselves to lose no opportunity of procuring the early extinction of this unjust and obnoxious tax."

THE CULTIVATION OF FLAX.

At a meeting of the North East Agricultural Association of Ireland, the Rev. Joseph Bradshaw read the following paper on "The preparation of the soil, the sowing of the seed, and the operations following necessary for the cultivation of flax." He said, after some preliminary remarks: As we are now approaching the season for committing the seed to the soil, a dissertation on the proper method of doing so must be more interesting at the present time than at a different period of the year, when our attention is taken up with other operations. I ought to remark at the beginning that I believe I cannot do better service to any desirous of obtaining information on this subject than by directing them to the revised instructions published by your special committee for promoting the growth of flax in Ireland, a copy of which your secretary will forward to any one requesting it. I may, indeed, enlarge upon these "directions," but it is very questionable whether it may be any improvement. It must be looked upon as a happy circumstance in the growth of flax that thorough draining, subsoiling, and ample manuring, which lie at the foundation of all good farming, are also the best preparation for this crop. But these operations ought to be performed previously to putting in green crops; then follows a grain crop—wheat, oats, or barley—and after the grain crop flax. This is the usual and approved place for it in the rotation followed in Down, and I believe also in most of the best cultivated districts in Ulster. One great advantage in this rotation is that, should the flax prove a failure, you do not lose all, as the grain crop has yielded a return for the expenses of the previous green crop; and many are of opinion, moreover, that flax succeeding wheat is superior in quality, and seldom, if ever, less in gross weight than when it succeeds potatoes. I might mention here, in passing, that it is not usual to sow it after turnips—so unusual is it that I never knew an instance where it was done except in my own case, and once I did so, partly by way of experiment as well as to bring the field into rotation with others beside it. The land was well suited for flax, and in a high state of fertility, and, consequently, the crop was a good one. Nevertheless, I believe the custom that prevails of not sowing it after turnips is the result of experience. Again, another advantage in this rotation is, that now is the time to sow down with grass seeds, and the flax is the very best crop for so doing, very superior to any other. Both the time at which it is sown, as well as the pulling of it, are very favourable to the growth of the young grasses, so much so that not only the following hay crop but even the pasture retains its superiority over that sown down with any other. It would be very difficult fairly to estimate the advantage arising in this way, the credit of which is fairly due to this rotation. Before leaving this part of my subject, I might mention that I never knew an instance of flax following immediately after breaking up lea. I have heard of such, however; and, although it is possible it might succeed in some exceptional cases, yet I feel quite decided in saying it should never be attempted. Having decided the rotation, I come now to the preparation of the soil immediately before sowing the seed, and here I feel more at a loss to know what I should omit than what I should say, for it seems puerile to give directions or offer observations about ploughing and harrowing; still, it must not be forgotten that many in the other provinces of Ireland are anxious to hear, even to minute particulars, the system pursued here. When the land is foul, and withal it is determined to put flax on it, which cannot, under such circumstances be recommended, the proper way is to have it thoroughly cleaned and pulverised by repeated ploughings with intervening grubblings and harrowings—similar, in fact, to a preparation for a green crop, only that this preparation should be completed in autumn, so as to allow the soil to be consolidated before the seed is sown, as the flax thrives best with a fine clean surface and a firm bottom. Another way to prepare, and which, I believe, answers remarkably well, is to grub the stubble early in autumn, either with a broad-toothed grubber or Bentall's broadshare;

plough it once afterwards during the winter, and allow it to remain so till seed time. But a third method, and one which I decidedly recommend as being at once simple, easy, and effective, especially if the land be clean and in proper condition, is to plough down the stubble any time after the middle of December, and if possible before the end of January, with only a moderately-deep furrow—say five or six inches, and then a few days before sowing to harrow and grub, only taking care not to put the grubber more than three or four inches deep, so as not to disturb or bring up any of the stubble; all weeds and stones should then be picked off, the harrowing repeated both up and down and across, picked again, if necessary; afterwards it should be well rolled with a heavy roller, after which there should be a stroke of the harrow straight up and down; then sow the seed, give two strokes of the harrow, followed by two strokes of the seed harrow, again roll, and finally finish by giving a stroke of the seed harrow across. It is not usual to harrow quite so much, but if the ground be dry and the weather favourable, you need not fear in doing too much in this direction. Many also do the harrowing across before the second rolling. This is objectionable, however, as it drags the seed too much into the furrows, especially if the ridges be narrow, which they ought not to be; whereas, if the roller be first applied before the final cross harrowing, this evil is avoided. The clover and grass seeds can be sown any time it is thought judicious before the second rolling. If there is reason to suppose that the land is not in good condition, an application, to the extent say of 3 cwt. of some of the excellent manures manufactured in Belfast for the purpose, may be made with great advantage, harrowed in before sowing, 1 cwt. of Peruvian guano, 2 cwt. of bone ash or fine ground bones, or superphosphate of lime; and from 5 to 10 cwt. of common salt, or refuse salt from the pork stores, will also form an excellent manure, and will be a liberal allowance for a statute acre. I never heard of farm-yard manure being applied, nor do I think it would answer. The quantity of seed should vary according to the fertility of the soil, rich loams and deep alluvial flats requiring less than poor soils, and on elevated grounds; but the usual quantity for medium soils may be put down as follows: one Riga barrel will be sufficient for 1 acre Irish, $\frac{1}{2}$ acres Cunningham, or 2 acres English. These figures will be easily remembered, and are pretty nearly correct; but, to be very accurate, I have ascertained that a Riga barrel will exactly do for 1 a. 3 r. 20 p. English, and that will be as nearly as possible 2 bushels for one acre, and so on; 1 bushel for two rods, $\frac{1}{2}$ bushel, or 16 quarts, for one rod, 8 quarts for 20 perches, and down as low as you like to calculate. It is very useful to remember these low figures, for by allowing the sower to take a certain number of quarts in the sowing sheet every "bout," and then measuring the length and breadth thus sown, you can tell to a nicety whether he should put on more or less than he is doing, and to let him alter his hand accordingly. It is a very difficult thing to sow this seed evenly and properly, but by a little care and calculation a man who is accustomed to sow grain will soon come to know the exact quantity. The seed is very slippery, so that it can scarcely be held in the hand, and consequently I find that almost all sowers do not sufficiently calculate on the seed dropping out as they draw their hand backward. This might be guarded against, either by walking a little more to the left hand side than usual, or by throwing the seed well in front, as the backward swing of the hand gives abundance to the right hand side. Riga seed is preferred for land considered suitable for it; but when the soil is a clay, or a considerable mixture of clay, Dutch seed is almost always sown. A Dutch hoghead contains two Riga barrels. The proper time for sowing in this part of the country is the month of April, the last week in March and the first in April being considered early, whilst the last week in April and first in May are late. In some districts, however, which are elevated, or with a bleak northern aspect, they sow as late

as the 20th of May; but this is more from necessity than choice. Last year I got one bushel of French seed from Mr. Duffin, of Belfast, who was desirous that I should make a trial of it to see how it would answer in this country. I did not get it until very late in the season, so that it was only sown on the 18th of May. It turned out remarkably well, notwithstanding, and yielded eighteen stone of dressed flax, which brought 3s. 6d. a stone; and, had it not been for the cold weather when in the water, I have no doubt the quality would have been much better, but this must always be looked upon as the great drawback to late sowing, for you may frequently have a good weighty crop, and yet lose to an incredible extent if you cannot get it watered before the cold nights of autumn set in. For this reason, therefore, if for no other, early sowing is very desirable, nor would I give the least encouragement to late sowing, although the example I have mentioned turned out beyond my expectation, owing no doubt, in great measure, to the favourable season, as well as the warm, well-sheltered situation of the field. When the crop is about three or four inches long, it should be weeded by women and boys, with light shoes or barefoot. Each one should have a knife, sharpened well at the point, to cut any large weeds immediately below the surface, as pulling up these is sure to destroy several stalks of flax. In no instance should there be a second weeding when the crop is ten or twelve inches long, as the injury done in trampling down the stalks would be far greater than any good that could possibly be effected. During the summer, straps or bands for tying the flax should be made, so as to be ready against pulling-time. These are generally made of rushes, half dried or so; but bent or spritty meadow grass will answer the purpose almost as well. The flax should never be used to tie with, as the band rets or rots in the water, and so will not hold together when taken out. The proper time for pulling is a very nice question, and one not yet settled even amongst experienced flax-growers. Many advocate early pulling, as the quality is thereby much improved; whilst the advocates of the opposite system say that, by allowing it to be rather on the ripe side, the additional weight of dressed flax gained thereby will do far more than compensate for any loss in quality. I believe both theories are correct to a certain extent, and so the nice point to be determined is the exact period when a combination of quantity and quality will yield the largest profit to the grower. No description of the appearance of the flax at this exact time, even should I pretend to know it, would be at all adequate to enable the inexperienced to determine it; and, as those who are thoroughly acquainted with the subject would not be likely to be guided by any argument I might use, unless it coincided with their own views, my observations would prove useless as regarded them also. I must just leave the controversy where I find it with this remark, that I would recommend every one, after he has discovered the profitable course, to keep to it. My own plan has been to pull it green when the season is late, and to pursue the opposite course when early. The reasons for this method are so obvious that I need not dwell upon them. Another question on which there is considerable difference is, the saving of seed. And, first, as to rippling. The way this should be done is so fully explained in the "Directions," published by your committee, that I shall not add anything to them, but merely say a few words on the subject. It is a very tedious and expensive operation, requiring much patience and skill; and, when the seed is rippled, it requires to be dried on a kiln, which is not always within reach; or, should this method not be taken, the degree of care and incessant work to get it properly winnowed will render it both a tiresome and expensive business, occurring, too, at a time when you are most anxious to get on as expeditiously as possible with other work. The seed, no doubt, is very valuable for feeding cattle; and it might pay for a man with a small holding, who can do all within himself, and whose family might not otherwise be profitably employed; but it will not pay for labourers at harvest wages: and this is the opinion, I believe, of almost all who have made trial of it. In the *Dublin Agricultural Review*, of February 17, there is a very sensible and excellent letter on the cultivation of flax, signed by "A Linen Merchant, Coleraine;" and, in a post-script, he states that, after seven years' experience, he aban-

doned rippling as an unprofitable business. Now, I did not stick to it for seven years, for I learned quite enough of it in two to induce me to give it up; and all, or nearly all the farmers in my neighbourhood who have made trial of it have arrived at the same conclusion. I had some conversation with Mr. Kennedy, the agriculturist on Lord Londonderry's estate, on the subject; and he agrees with me that, where labour has to be paid for, it will not make a return. In fact, I look upon it as purchasing 20s. worth at a cost of 21s., with a great deal of trouble and anxiety into the bargain. There is another mode, however, of saving the seed; and on this also I wish to say a few words before concluding. The way this is done is by allowing the seed to become perfectly ripe, and then pulling and drying the straw in the way described in the printed directions as the "Courtrai System," or simply by tiering it in small sheaves about half the size of an ordinary sheaf of oats, and stooking it for two or three weeks, and, when perfectly dry, putting up in a stack. During the winter season, the seed can be taken off either by lashing over a plank, or beating it on the barn-floor, or by the thrashing machine in the following manner: Take off the rollers in front of the drum, and raise the roof as wide as it can be set; then let the man grasp as much as he can conveniently hold at the root-end of the straw, and put the tops into the beaters, and, holding them there for a minute or so until the seed is thrashed off, draw them back again. The seed should be riddled, and the bolls beaten to bring out any seed that may remain in them. The seed thus saved is generally kept for sowing, and will answer very well if the produce of foreign seed. The flax straw is again stacked, and kept till the weather is sufficiently warm for putting it in water—say, about the middle of June. The great objection to this is that the farmer is kept out of a return for another year; and, in these times, this is no small consideration. And another objection is that the flax is injured both in quality and quantity to about the full value of the seed. Still, it might be desirable to save as much each year as would do for seed the following, taking care always to buy a little foreign from which to save the seed. This would render us more independent of foreign supply, as well as tend to keep down the price.

After a lengthened conversation on the subject of the paper, a vote of thanks to Mr. Bradshaw was moved by Mr. Borthwick, and seconded by Mr. Samuel Morrow.

HADLEIGH FARMERS' CLUB.—This excellent club held its annual "spring meeting" on May 13. The show of horse stock was large, and the prize cart stallion, a beautiful black chestnut, was much admired. There were six brood mares with promising foals at foot. The show of fat stock was larger than usual, but the sheep were less numerous. The prize for the best brood mare went to Mr. W. R. Pocklington, Chelsworth; that for the best gelding to Mr. J. Raynham, Oulton; best gest mare, Mr. C. E. Rand, Hadleigh; best colt under 27 months old, Mr. S. King, Preston; best gelding under 27 months, Mr. J. Gentry, Washbrook; best filly under 27 months, Mr. W. Gurdon, Brantham; best colt under fifteen months, Mr. M. Mumford; best filly under fifteen months, Messrs. W. and P. Stearn, Elmsett; best foal, Mr. J. Gentry; extra prize given by Mr. R. Sheldrake for the best foal by his horse Ironsides, Mr. J. Stow; best bull of any breed, Mr. W. Grimwade, Hadleigh; best polled cow, Messrs. R. and J. Rand; best horned cow, Mr. J. Nunn; best fat steer, Messrs. R. and J. Rand; best shearing top of any breed other than Southdown—of Southdown tops, it may be observed, there was no entry—Mr. J. Nunn, Whatfield; best shearing top of any long-wooled breed, Messrs. R. and J. Rand, who also received the prizes for long-wool ewe and wether hoggets, pure and cross-bred, and Southdown ewe hoggets; best boar, Sir C. Rowley, &c. In the evening the usual dinner took place at the Assembly Rooms, Sir C. Rowley presiding.

FISH GUANO OF NORWAY.

The use of fertilising matters, with a view to increasing agricultural products, gives rise to some of the most important questions of industrial economy, amongst which I know of none more vast or more enticing than the putting in connection the riches of the sea with arable land, cultivated by the hand of man. Whether it furnishes to the population direct nourishment, under the form of fish, molluscs, &c., or indirect nourishment, under that of manure, the sea appears to us like a reservoir of life, of an endless and incommensurable fruitfulness. The ichthyophagous population, above all, are the finest and strongest known. The Norwegians and Swiss, those hardy descendants of the Normans, who but lately made all Europe tremble, offer in that respect an example upon which the economist would do well to meditate; and with regard to the indirect action of the sea upon populations, we have only to reflect upon the operation of manure in certain localities—the isle of Noirmontiers, for example—to learn that the sterile sea of Homer has lost its signification.

The minister of agriculture and commerce published, in the *Moniteur Universel*, March 9th, 1863, an interesting article, extracted from "Annales du Commerce exterieur," treating of the Norwegian fisheries, as well as the best means of using its resources. This subject entered into the ordinary compass of my studies. As regards agriculture, a vast accessory industry is created by it, which we have several times tried to realise, but under too heavy conditions. A courageous agricultural pioneer, M. Rohart, has done better. With few material resources, but possessed of great courage, he has given an example of an energetic attempt, and taken upon himself the laborious task of going over the coasts where the fisheries are carried on, for the purpose of collecting the debris too often lost to agriculture. This was at once an intelligent enterprise and a good action.

A captain of the port of Nantes, had the kindness to bring me from Christiansund a sample of fish guano manufactured by M. Rohart, and I think it will be useful to agriculturists if I state the composition of this fertilising substance.

But, first, to show the importance of such a subject, I shall bring before you summarily, from the papers of the *Moniteur*, a statement of what the herring fishery in the vicinity of Bergen and isles of Lofoden produced—in 1862, 740,000 barrels of fish, being 858,400 hectolitres, at an average value of 11s. 40c. a barrel, fresh, which corresponds to 8,436,000*l.* From 25,000 to 30,000 fishermen, nearly amounting to 5,000 or 6,000 fishing smacks, are employed there, as well as 403 trading vessels and others, manned by 1,892 sailors, and measuring 182,500 tons.

In 1862, the cod fishery was exceptionally bad; it only produced 12 million fish, being half the yield of an average year.

Nearly 6,600,000 fish have been round (*whole fish*), and 4,200,000 opened and dried upon the rocks (*Klipfish*); the rest were consumed by the fishermen or lost. They estimated the oil obtained at only 15,000 barrels (17,400 hectolitres); that is to say, nearly a third of an average year; and the refuse taken from the fish they estimated at 7,000 barrels (8,120 hectolitres).

It is calculated that, upon an average, 20 fish dried flat, and from 27 to 28 dried round, weigh 18 kilog., therefore the total weight of the merchandise prepared that year was only 8,100,000 kilog., whilst in 1860 it was 18,900,000 kilog., and in 1861, 15,040,000 kilog.

According to fresh papers, inserted in the *Moniteur* Dec. 24th, 1863, the produce of the herring fishery was estimated at nearly 730,000 barrels, an inferior result to that of 1862, which has been considered good. The number of hands employed in this trade now amounts to nearly 30,000—quite a population.

The cod fishery produced in 1863 17,400,000 fish, a number only exceeding that in 1862 by 5,400,000, which was considered exceptionally bad.

In an average year, the produce of the Norwegian fisheries is from 20 to 25 millions of cod fish, representing 100 millions kilog. weight alive. It appears that the weight of refuse thrown into the sea amounts to 33 per cent,

We see by these figures what quantity of debris—heads, tails, entrails, vertebrae, &c.—might be collected, without reckoning the non-edible fish, which are only fit for manure.

The official document from which I borrowed these figures speaks of the means of allowing the Norwegian fishermen and French purchaser the liberty of seeking the refuse in three or four ways, the action of which caused it in 1862 to fetch a price of 28*l.* or 38*l.* 60c. in the Lofoden Isles, and 50*l.*, or even 56*l.* the barrel in Bergen. It pointed out to the Chamber of Commerce the possibility of getting economically supplied with the refuse through M. Rohart. That gentleman is, in fact, better able than any one to appreciate a commercial situation, from the improvement of which Norwegians and French have much to gain.

I now come to the examination of a sample of fish guano, from the manufactory established by M. Rohart, brought from the coast of Norway by Captain Peillae. It presented the form of a yellow mass, in small fragments of a uniform thickness, exhaling the smell of dried cod, and revealing by their aspect the action of a slight modification under the influence of heat. The reagents susceptible of dissolving the phosphates, such as water, charged with carbonic acid, or certain saline principles, act rapidly upon Norwegian manure. The nature of its organic tissues shows that aptitude for solution which, whilst easy, has not the inconveniences we justly allege against matters partly ammoniacal. Reduced to a very fine powder, then sifted, and afterwards exposed for five hours to a temperature of 100 degrees centigrade, the Norwegian guano lost 10 per cent. of moisture. Analysed dry, it furnished—

	Average.
Organic matters and volatile principles at { 62.40	} 62.20
a red heat { 62.00	
Alkaline chlorides { 1.00	} 0.97
..... { 0.95	
Phosphate of lime { 33.50	} 34.00
..... { 34.50	
Insoluble silica { 0.80	} 0.80
..... { 0.80	
Carbonate of lime 2.33	
Sulphate of lime..... traces	
	100.00

Azote, 9.5 per cent.

With its 10 per cent. moisture, fish guano of Norway must, therefore, contain the proportions of matter indicated as below (column A); column B shows the result of an analysis made directly upon a portion of humid manure, that is to say, in a marketable state:

	A.	B.	Average.
Organic matters & volatile prin- ples at a red heat (water 10 per cent., organic mat. 55.98)	65.98	{ 66.90 65.90	} 66.40
Alkaline chlorides	0.87	{ 0.90 0.89	} 0.89
Phosphate of lime	30.60	{ 30.00 30.30	} 30.10
Insoluble silica	0.49	{ 0.49 0.49	} 0.49
Carbonate of lime	2.06	2.13	2.13
	100.00	100.00	100.00
Azote	8.55	8.80	100

M. Voht recently published, in *Polytechnisches Journal*, an analysis of artificial Norwegian guano, which assigned to that manure a richness corresponding to nearly 29 per cent. of bone phosphate of lime, and 7.74 per cent. of azote. The moisture of the matter analysed amounted to 17 per cent. It will be perceived that my figures differ sensibly from those of M. Voht; and the homogeneous nature which was brought to me direct from Norway by Captain Peillae leaves no doubt in my mind of the correctness of my experiment.

The chemist whose analysis I am about to mention advised agriculturists to treat Norwegian manure with sulphuric acid.

I will take care to try it. Nature has given to the detritus derived from organism, and particularly to the debris of fish, a chemical constitution and physical aggregation; so that, under the multiple influences of the soil and vegetative forces, the materials of this detritus become assimilated by the plants. Such will be the effect of Norwegian manure, all the azote and phosphoric acid of which will be employed, contrary to what often happens in the use of Peruvian guano and superphosphates. In fact, these manures do not always answer to the hopes of those who purchase them; and one of two things must be the cause—either their azote becomes volatile, or their phosphates are drawn away from the place assigned to them.

The experiments made by M. Stockardt and M. Rauch, with a view to showing the actual expenditure of Peruvian guano during different stages of development in plants, have made known to us that bone products, which at the commencement of vegetation only furnish 5.79 per cent., at the same time that guano furnishes 12.85, give, on the contrary, at the season of florescence, 20.57, whilst guano gives no more than 10.75. Since that time, some interesting attempts have been made to lessen the inconveniences of Peruvian guano by using it in small doses, repeated several times. In the culture of primitive or transition earths, it is well known that guano is far from furnishing in a period of three years the results obtained from bone charcoal.

It is proper to add that, although sufficiently charged with carbonate to assist in the neutralisation of acid soils, the Norwegian guano, nevertheless, does not contain such a quantity of the calcareous principle as the solvent action of the *landes* or recently cultivated earths need, to accomplish their principal aim—the dissolution of the phosphate of bones—in the same manner as that shown by the animal black in the sugaries in the north of France, generally very rich in carbonate of lime (15 to 25 per cent.).

To utilise, for the benefit of agriculture, residues but lately thrown away; to co-operate at once for the improvement of the condition of the poor Norwegian fisherman and the French cultivators; to establish a freight for the marine, and a new bond between two people, which time and events seem every day to be strengthening and making more intimate, it, as I have said before, and repeat now with pleasure in conclusion, at once a rational and good action.

With this double title, the manufactory courageously established on the coast of Norway by M. Robart deserves such encouragement as I hope will not be withheld from him, either in France or any other country where the name of Frenchman is a passport to a cordial hospitality.

ADOLPHE BOBIERE,

Correspondent of the Imperial and Central Society of Agriculture.

Nantes, Dec. 31st, 1863.

REVIEWS.

OUR HOUSE AND GARDEN: WHAT WE SEE, AND WHAT WE DO NOT SEE IN THEM. By CUTHBERT W. JOHNSON, F.R.S. (London: Ridgway and Co., 169, Piccadilly. 1864).

We can warmly recommend this little book to all housekeepers as well as lodgers. It contains a complete and most minute account of everything connected with domestic affairs, entering into every room of the house, examining and reporting upon its furniture and contents, the causes of their healthiness or the contrary; enters into the question of economy in housekeeping, giving recipes for various departments of domestic management, &c., &c. All the above, and a great deal more, refers to the house, and occupies three chapters. The garden has six, five of which relate to plants, showing the water they need, the air they breathe, the soil they grow in, their leaves, flowers, &c., &c. The following extract will show the familiar and useful style in which the work is written;

"Beer.

"Of the beer we drink we commonly know more of the qua-

lity and strength than of its nature and composition. Its strength, we all know, varies, and that is entirely owing to the varying proportions of alcohol (rectified spirit) which it contains. The alcohol of beer is produced by the fermentation of sugar; in whatever way the process is varied, it all depends upon the amount of sugar in the material employed whether the beer is strong or weak. The simplest way of making beer, in fact, is by boiling some hops in water, then dissolving in it some foams sugar, and fermenting the wort with a little yeast. Whether we employ malt or bestroot, or any other substance, still it is the saccharine matter contained in the material we brew with, to which, by its fermentation, the production of the alcohol of the beer is owing."—P. 123.

AGRICULTURE, ANCIENT AND MODERN: A Historical Account of its Principles and Practice as exemplified in their Rise, Progress, and Development. By "THE OLD NORFOLK FARMER." (*J. S. Virtue, City Road and Ivy Lane.*)

An old and valued correspondent of our own has here undertaken quite an Herculean labour, but with every promise of achieving a most successful result. The work will be published in two-shilling parts, very liberally illustrated, while the one before us treats becomingly enough on the history of the appropriation of land, of agriculture ancient and modern, the nature and origin of freeholds, the value of land at different periods, the aggregation and sub-division of land, cottage allotments, rural economy and the farm labourer, poor-laws, tithes, and the abuses of the game-laws. Every page evinces immense research, as well as a practical knowledge of the subject under consideration, while instead of aiming at a merely dry treatise, the style is bold, vigorous, and healthy. There is little doubt but that the work will become one of standard authority, but on some far better showing than simply as a book of reference, as the "Old Norfolk Farmer's" own opinions must conduce to a deal of suggestive consideration, or quasi-discussion between himself and his reader. It is satisfactory to add that both author and publisher have so far done their duty by each other, as this first part is very handsomely turned out by Mr. Virtue.

PUBLIC DINNER TO MESSRS. PAGE AND HARDING, OF ST. ALBAN'S.—It was determined by numerous friends of Messrs. Page and Harding, in appreciation of the benefits they found to have arisen from their weekly market sales, to invite those gentlemen to a public dinner. The dinner took place accordingly at the Sun Hotel, Hertford, on Tuesday, May 17. About 200 gentlemen were present, and the dining-room being of insufficient proportions to accommodate all who wished to obtain places there, the others disposed of themselves in the room adjoining. The chair was occupied by Mr. James Smyth, of Bygrave, supported on the right by Mr. Page, and on the left by Mr. Harding. Mr. Harding, in responding for the firm, said: If you will allow me I will give you a few details from my notes with respect to the sales we have held. Our first sale of fat stock in this market was held on the 30th of March, 1852, now upwards of twelve years ago; and from that time up to the end of 1860 they were held once, twice, and sometimes three times in a month. In the beginning of 1861 we commenced, and have since continued to hold them weekly. We sold in 1856, £18,748 17s.; 1857, £38,792 19s.; 1858, £53,082 1s.; 1859, £42,806 3s.; 1860, £51,354 2s.; 1861, £65,345 4s.; 1862, £79,496 5s.; 1863, £107,018 16s.; making a total of £456,419 7s. Stock sold last year, 1863: 1,877 oxen, 82,469 sheep, 123 calves, 2,702 pigs, 1,166 lambs; total head of stock, 98,657,

IMPORTANT TO FARMERS.

SEVERE SENTENCE FOR SENDING DISEASED CATTLE TO NEWGATE MARKET.

At the Second Criminal Court, on Tuesday last, the following case was tried before Mr. Commissioner Kerr:—

George Thompson Smith surrendered to his bail, and pleaded "Guilty" to an indictment charging him with having, on the 28th of March, sent 300lb. weight of diseased meat to Newgate-market, which was unfit for human food.

Mr. Poland prosecuted, and Mr. Bealey defended.

Mr. Poland said this was one of the ordinary cases prosecuted by the Commissioners of Sewers, in which diseased meat had been sent to market. It appeared that a farmer named Westmoreland had a diseased cow in his possession, that the prisoner killed and dressed it, and sent it to London. There was no doubt whatever that the animal was unfit for human food. The prisoner alleged that he was a butcher, and there was no doubt that he was a young man of good character, and that others who were in the back ground were leagued with him in forwarding the diseased carcase to London.

The Commissioner asked how it came to pass that the prisoner should have been prosecuted under the circumstances.

Mr. Poland replied that the answer was simple enough. It was because the respectability of the prisoner could not have been ascertained until the necessary inquiries had been instituted after the examination before the magistrate.

Mr. Bealey said he had no fault to find with the Commissioners of Sewers for the part they had taken in the present case. Still, if the whole of the facts had come out before the magistrates, it was probable the prisoner would not have been sent for trial, because all he had done was to write his name upon the ticket which consigned the carcase to London. Under his (the learned counsel's) advice the prisoner pleaded guilty, because in misdemeanours of this kind all accessories were treated as principals. With the exception of the heart, which was unquestionably diseased, the rest of the animal was fit for human food; and, under all the circumstances, it was hoped the Court would only inflict a moderate fine, and not send the prisoner to Newgate. There were several witnesses to character in Court.

The Commissioner said he was not unwilling to hear evidence to character, but he had a strong idea that a bill should be sent before the grand jury against Mr. Westmoreland. He wished to know what the learned counsel for the prosecution had to say upon that point.

Mr. Poland said a prosecution against Mr. Westmoreland was certainly deserving of consideration.

The Commissioner ordered the prisoner to stand down for the present.

At a later period of the day the prisoner was brought up for sentence.

The Commissioner then said that he stood convicted on his own confession of having sent a quantity of meat to London to be consumed principally by the poorer classes, but generally by all classes, thereby spreading disease among them and their families. The court looked upon this as a much worse offence than that of one against property, because when property was stolen there was speedily an end of the injury inflicted, but when diseased meat was sold to the public it was

utterly impossible to know where the injury caused thereby would have a termination. The offence was one which was greatly upon the increase in London, and farmers and others in the country seemed to think that the metropolis was the place to which putrid meat was invariably to be sent. He (the Commissioner) gathered this fact more particularly than ever before from the depositions in the present case, because he found Mr. Westmoreland saying, "If it is not good enough to be eaten let us bury it;" whereupon the prisoner observed, "No, let us send it to London;" and accordingly it was packed up and to London it was sent. The prisoner had been recommended to mercy by the prosecutors upon the ground that they believed others were more criminal in the matter than he was; but, notwithstanding that recommendation, there were circumstances in the case, so far as the prisoner was concerned, which could not be overlooked. There was nothing on the face of the depositions to justify his conduct. In the first place he was a butcher by trade, and therefore he must necessarily be supposed to have known much more about the difference between good and bad meat than other people. Moreover, he had been brought into connexion with the dead animal, for he had killed it; and yet the first thing he had done afterwards was to send the diseased carcase to the London market. Doubtless it was assumed on the part of the people of the district to which he belonged that they might dispose of any sort of putrid flesh in the markets of the metropolis, but this was a supposition of which their minds must at once be disabused, by teaching them that the law was sufficiently strong to reach them when they practised acts of such an unwarrantable character. The sentence was that the prisoner be imprisoned and kept at hard labour for six months, that he pay a fine to Her Majesty of £50, and that he be further imprisoned until such fine be paid.

SOMETHING THAT FARMERS NEED.—Every farmer needs a nail box, well stocked. He should have at least nine sizes. The following table will show anyone at a glance the length of the various sizes, and the number of nails in a pound. They are rated "3-penny, up to 20-penny." The first column gives the number, the second the length in inches, and the third the number per pound. That is:—

3-penny . . . 1 in.	557 nails	12-penny . . . 3 in.	54 nails
4-penny . . . 1½ in.	353 nails	20-penny . . . 3½ in.	34 nails
5-penny . . . 1¾ in.	232 nails	Spikes 4 in.	10
6-penny . . . 2 in.	167 nails	Spikes 4½ in.	12
7-penny . . . 2¼ in.	141 nails	Spikes 5 in.	10
8-penny . . . 2½ in.	101 nails	Spikes 6 in.	7
10-penny . . . 2¾ in.	68 nails	Spikes 7 in.	5

From this table an estimate of quantity and suitable sizes for any job of work can be estimated. A farmer's nail box should be divided into ten compartments, one for each sized nails and one for spikes. It need not be large, because it is only intended for jobbing, and to have a suitable sized nail for all purposes always at hand. It should have a good strong handle, like the bail of a basket. Two or three gimlets, an awl or two, and a nail-set should have places in the nail box, and, of course, the hammer. Another tool-box should contain two saws, a plane or two, several files, punches, cold chisel, et cetera.

CALENDAR OF AGRICULTURE.

This month includes the general sowing of turnips over the kingdom. The land must be well pulverized, all weeds and stones removed, and rolled flat. Open the drills with a bout of the common plough, or with one furrow of the double mouldboard plough. Lay the dung in the hollows, from one-horse carts. Spread it evenly; cover it without delay, by splitting the ridglets by a bout of the plough; and sow the turnip-seed immediately on the fresh tilth. On cloddy, crumbling soils, roll the drills on the flat ground without delay: it crushes the clods, closes the surface against drought, and acts as a lock and key as regards the moisture in the land. In dry seasons this operation is very beneficial.

Sow swedes till the middle of the month; then go on with Green Rounds, and ultimately sow the White Globes.

Sow by the drop-drill all artificial and auxiliary manures, as bones, guano, ashes, bran, and rape-dust, and roll immediately.

Turnip-sowing should be mostly finished this month.

Plough pared and burned lands on which ashes are spread, with a thin furrow. Harrow it smooth by repeated harrowings. Sow the seeds by hand, in turnips or rape, and cover by a single or double tine of the grass-seed harrows, and in some cases by a rolling of the ground. If the lands are deep

and loamy, work the soils and drill the grounds in the usual way of turnip tilths.

Plough the intervals of the drills. Horse and hand-hoe potatoes, beet, parsnips, and carrots. Plough potatoes deeply on stiff soils; and break the drills well with the hand-hoe. Minute care adds much to the success of crops.

Shear sheep, and mark by distinctive signs the different ages and conditions. Wean the lambs of the year, and place them on the best pastures. Put mares to the stallion regularly.

Cut and destroy all weeds on pastures. Pull all tall weeds among grain crops, and destroy all weeds on the sides of roads, ditches, and hedges.

Hay harvest will commence in the end of the month. Clovers, sainfoin, and forward meadows may be cut. Get the crop dried and stacked quickly.

The mowing and making of hay requires plenty of hands, kind treatment of the labourers, quickness and despatch in every operation. Allow five or six haymakers to each mower, besides the hands that may be required in the carrying process. In favourable weather hay may be stacked in forty-eight hours after being cut, when it has been properly managed, by being alternately and repeatedly cocked and turned over in spreading. In stacking hay, it is better to let it sink and consolidate by its own weight in the rick, than to tread it into firmness, as is generally done.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

The first week, sow peas in the early sorts, as Hotspur, Charlton, and Cormack's Kent, with a few rows of the Tall Marrow. Peas sown late rarely escape mildew. Sow kidney beans and runners for succession, and cabbages to come in speedily, Dutch turnips for autumn, carrots and onions to be drawn young or stand the winter.

In the fourth week sow again turnips, salads, and lettuce.

Transplant Cape broccoli about the middle of the month; cauliflowers for August, in ground made rich with compost. Also transplant borecole, Scotch kail, Savoy, and Brussels sprouts.

Asparagus-beds still yield, but should not be cut beyond the 10th. Beds and rows are mutilated by too close cutting. A shoot should always remain untouched to each crown. Scatter rich earth, with droppings, over the beds; but avoid salt, for on wet leaves the particles decompose the tissue, and the plant dies. Better mix the salt in the compost-earth, and commit it to the ground.

Plant young lemon-thyme, lavender, sweet marjoram, basil, and also slips of lavender, rosemary, rue, and other hardy sweet herbs, in cool, shady beds, for subsequent transplantation.

Cut the aromatic herbs for drying, when they

begin to show flower. Thin out onions by degrees, for use, leaving the bulbing stocks from five to six inches asunder. In dry weather, frequent light hoeings, to prevent cracking of the surface, will attract moisture, and bring on the plants. Neglected beds of onions are thus often destroyed.

FRUIT DEPARTMENT.

Apple and pear espaliers and dwarfs have produced many young shoots, of which the ill-placed ought to be removed to the bottom, and the others may remain for a month longer. Foreshortening is best done in the close of the growth.

Strawberry-rows should be stringed on each side; the twine fastened to short sticks, so as to support the entire rank of trusses.

FLOWER GARDEN.

Arrange any greenhouse plants now brought forth in neat order, under some fence facing the north. Plunge Indian azaleas in a peat border. Arrange flowering shrubs, and also herbaceous plants, in situations that throw the low ones in front, and rising in gradation to the highest behind. Display the colours in order in any miscellaneous collection.

Take up bulbs when the green plants change colour and become dry.

FOREIGN AGRICULTURAL GOSSIP.

A rather warm discussion has taken place among the members of the Central Agricultural Society of France with reference to crossings and the value and utility of mongrels as re-producers. It remains now to be considered whether the crossing system, the utility and economic advantages of which are now no longer contended by any one at a certain point of view, can form fixed breeds. Here is a moot question. Many zootechnicians, and among them M.M. Baudement and Renault, have pronounced for the negative; but the affirmative counts numerous partisans, and among others M. Magne, who has engaged to prove his thesis, and to furnish, besides, the elements of a new discussion. M. Magne, supporting his theory by facts which have transpired during the Mexican campaign, called the attention of his *confères* to the advantages which the substitution of maize for oats may present when a bad harvest has raised the price of the latter. Thus, the French horses received in Mexico a daily ration of 9 lbs. of maize, 11 lbs. of forage or hay, and 2½ lbs. of bran; but during a trying campaign, extending from October, 1802, to June, 1803, under very unfavourable hygienic conditions, this ration sufficed for the maintenance of the animals, which expended a considerable amount of energy and muscular effort in order to overcome obstacles of every kind which the wheel-ruts and quagmires of steeply-inclined roads opposed to their progress, their difficulties being aggravated by great pieces of rock with which the roads were strewn, while they had to toil along under an arid sun, and without any other drink than tainted water. Maize possesses the nutritive qualities required for repairing the waste by the respiratory organs which horses submitted to laborious work undergo. M. Magne insisted on this conclusion by showing that a horse which consumes 9 lbs. of maize absorbs as much rich nutritive matter as if he consumed 16 lbs. of oats. M. Magne did not conceal the fact that maize inspires a certain repugnance among horses which are not accustomed to it, but he showed that colts accommodate themselves easily to this mode of nourishment, and that by mixing it with other food, old horses end by liking it. However this may be, the facts observed in Mexico, and summed up by M. Magne, tend to show the suitability of rations very rich in hydro-carbonated matters, for horses which sustain great fatigue. They prove besides, that in seeking for substitutes for hay and oats in feeding horses, it is not so much by varying the physical properties of the food supplied that a solution of the problem can be arrived at, as by taking account of its chemical composition, so as to compose rations similar in this respect to those which it is desired to replace. These observations are based upon facts which cannot be neglected by practice; but M.M. Chevrel and Barral reminded the Society that in comparing different foods, account must not only be taken of the proportion of hydro-carbonated elements, but still further of the nature even of the immediate principles which furnish them. In a letter which followed close upon the communication of M. Magne, an able agriculturist of the South of France, M. Dunard, of the Pyrenees-Orientales, confirmed the opinion of the director of the Alfort establishment, on the utility which the use of maize in the feeding of horses may present. During the summer at Perpignan and its environs, maize almost everywhere replaces oats in the feeding of horses; but as this grain is hard and old horses cannot easily bruise it, care is taken to have it previously soaked in water for some hours. Such are the facts in all their simplicity, and in bringing them to the knowledge of the Society M. Magne disclaimed the pretension of laying down in the matter of food the basis of a kind of theory of substitutions. His aim was more modest; he confined himself to examining with each other, with reference to their effects on working horses, the substances which figure most ordinarily in the rations of these animals, comparing, for example, hay, oats, wheat-straw, and maize (rich in hydro-carbonated bodies), with lucerne, trefoil, horse-beans, barley, and rye (which comprise proportion-

ately a much larger quantity of azoted elements). But M. Magne never sought to show that all the substances containing hydro-carbonated elements have the same nutritive value as oats and maize. While upon the subject of the proceedings of the Central Agricultural Society of France, we may note that M. Robinet pursues his hydrographic studies with indefatigable zeal and perseverance. M. Robinet has traced out the plan of a great hydrographic work, in which he proposes to study the waters of France from a chemical, geological, agricultural, and hygienic point of view. The work will be a long and difficult one for the author, who, feeling fully the weight of it, appealed to the politeness and intelligence of his colleagues in the Central Agricultural Society of France, begging them to assist him with their counsel and good advice. M.M. Gareau de Kergolay and Barral immediately responded, indicating to M. Robinet the importance and agricultural utility of an infinite number of small water-courses which do not figure upon maps, the length of which is very limited, but which do not the less render great services for the irrigation of prairies. The nomenclature of these little rivulets is all the more incomplete as some of them are only of a temporary character, and have been omitted from the maps published by the Ministry of War. But they are well known, and their advantages are fully appreciated, in the localities which they traverse. It is necessary, then, to take account of them from an agricultural point of view; but this necessity is not calculated to facilitate the work of M. Robinet, which already attains very remarkable proportions. However, he will not shrink from this new complication of the task which he has imposed upon himself.

The *Journal d'Agriculture Pratique* publishes an engraving of specimens of the ovine breed of Picardy. This race of sheep is an emanation from the Flemish breed, which is derived from the group specially designated by naturalists under the appellation of long-legged sheep. This group originated from the coast of Guinea, and became naturalized in Europe by importations into Holland, whence it spread over parts of Holland and France. The long-legged sheep has more particularly shown itself adapted for rich and humid lands, which alone can furnish it with the abundant nourishment required for sustaining its large dimensions. The districts in which it has not found all the abundance and all the richness of food which it requires have brought it back to smaller proportions. In becoming acclimatized to Europe, the breed has grown woolly, and has almost everywhere lost its frontal horns; its body has also come nearer to the ground, although it is still very highly mounted. In Holland the stock has formed the race of the Texel; in the Low Countries, the Frisonne breed; in Germany it has given the immense ovine "population" known under the generic name of German sheep. In Belgium, and among the French, it has constituted the Flandrine or Flemish race and numerous sub-breeds, all devoted to the production of meat, and forming a striking contrast with the important tribe of merinoes, exclusively reared for their fleeces. The type of foreign meat-producing breeds, the Flemish sheep, is distinguished from all the other breeds of Europe by the elevation of its height, its length, and the narrow form of its body. Thus some rams have been remarked which measured from the nape of the neck to the spring of the tail as much as 6 ft. 6 in. Its head is well developed, but without horns, and it carries its ears horizontally; its chest is long, its tail is thin and long, its frame is heavy, and its members are large, solid, and heavy, such as would be desired in a draught beast. The gait of the breed is firm and free, and indicates that they are good walkers, a useful quality before the establishment of railways. Animals of this breed are great eaters, and consequently are not very economical to graze. The wool attains a length of 8 in. or 9 in.; it is abundant, unequal, and of mediocre fineness, if such a term can be applied to it. The sub-Picardian breed is not so high or so long as the parent

breed; its wool also is shorter, but, as a compensation, is a little less coarse. The fecundity of the Flemish race of sheep deserves particular mention. The female generally gives two lambs at a time, and as she yields an abundant quantity of milk, she nourishes them without fatigue, and brings them up well. This is an advantage, but it appears that in the past the fecundity of the breed was still more active. Thus Grogner said the Flemish ewes very frequently yielded two and sometimes three lambs at a birth. M. Magne speaks of an old author who went further back, and reckoned, in the early days of the introduction of the breed into France, from three to six and even seven lambs from each ewe annually. The proof of this assertion is not given, but in order to contradict it reliance is only based on the fact of a fecundity much less active at the present period. It does not seem possible that a ewe could give six lambs at a time; but if she had two bearings annually, incredulity would vanish before evidence. The bulletins of the Acclimatisation Society report facts of hereditary fecundity more surprising, but the authenticity of which appears above the reach of suspicion. They speak of Chinese breeds which bear lambs twice in each year, and give each time from two to five lambs. They also make known a Russian breed, that of Romanowski, particularly remarkable for its fecundity.

THE FRENCH WHEAT TRADE.—In the first half of April wheat rose on an average 1.60 d. per quintal in France, and in the second half of April 0.50 d. per quintal, making a total average advance for the month of 2.10 d. per quintal. It now appears that in the first fortnight of May a further average rise of 1.20 d. per quintal was established, making an advance of 3.30 d. per quintal in six weeks. This is not much but still it shows a gradual upward tendency. The last average advance of 1.20 d. per quintal was made up as follows:

District.	Average price.	Rise.	Fall.
	l. c.	l. c.	l. c.
North West.....	23 16	0 15	—
North	23 00	0 32	—
North East	23 03	0 40	—
West.....	22 75	0 07	—
Central	22 28	—	0 01
East	23 99	0 11	—
South West.....	24 55	0 01	—
South	25 62	0 29	—
South East	25 39	—	0 25

Advices received from Paris on Saturday, with regard to the growing crops in France, state that although the long and persistent drought of April was everywhere hurtful, the wheats generally promise well. Spring sowings have been everywhere effected well, and potatoes show a good leaf in many localities. Vegetation is somewhat backward in France; but if rain now alternates with warm weather—and it appears to have done so during the past week—French cultivators may calculate on a good year. From Spain, where last year cereals made a default, especially in the southern provinces, we learn that the aspect of affairs is this year more favourable.

THE FRENCH WINE TRADE.—The exports of *vins ordinaires* from France in the first two months of this year compare as follows with the deliveries in the corresponding period of 1883:—

Direction of Exports.	1884.	1883.
	Hectolitres.	Hectolitres.
England	13,615	14,208
Belgium	13,014	14,583
German Association ..	8,307	1,913
Hanse Towns	20,707	14,611
Kingdom of Italy	39,411	13,293
Switzerland	25,214	39,868
United States	28,060	17,606
Brazil	18,209	15,280
Algiers	42,321	41,741
Other countries	99,221	105,394

Total..... 310,075 278,632

The Kingdom of Italy, the United States, Switzerland, the

Hanse Towns, Brazil, and Algeria, purchased the most wine from France in January and February, 1884. England only comes in the seventh place, after Belgium. Of the *eau-de-vie* and alcohol exported from France in the first two months of this year, England took, however, the lion's share.

FRENCH AGRICULTURAL STATISTICS.—There are in France 3,000,000 horses, 400,000 asses, 830,000 mules, 10,200,000 head of horned cattle, 300,000 stock bulls, 2,000,000 oxen, 6,800,800 cows, 6,100,000 calves, and 35,000,000 sheep. To pasture these, there are 7,600,000 acres of grass and 6,800,000 of arable and marsh land.

DUTCH CATTLE.—It appears that the deliveries of Dutch cattle at Harwich last week by the Great Eastern Railway Company's steamers Prince of Wales, Norfolk, and Princess Alice, comprised 230 oxen, 233 calves, 147 pigs, and 115 sheep, in all 715 head. On Friday, at Mr. Sexton's weekly auction, there was a large attendance of buyers, and the cattle offered went off with a spirited competition. 65 fat beasts making from £16 to £25 10s. per head, 40 steers, and heifers £5 10s. to £8 10s., 8 cows £8 to £18 10s., fat calves £3 to £4 10s., and 215 fat hogs 35s. to £4 4s. each. The attendance at these sales increases.

SCOTCH LIVE-STOCK SALES.—EDINBURGH.—Last week's advance was well maintained for the better class, and all kinds met a good demand at full currencies. About fifty of the best class of bullocks would average fully £32 a-head, selling from £20 up to £26 a-head; other fifty would average about £18, selling from £16 up to £20 a-head. The best class of cows sold from £16 up to £21; secondary sorts and small heifers from £11 to £14 a-head. Aged sheep in the wool sold from 45s. to 53s. 6d. a-head; clipped hogs sold from 3s. to 39s.; small crosses sold from 32s. to 35s. a-head; blackfaced wethers sold from 42s. to 47s. a-head. Fat pigs from 50s. to 60s., and up to £5 a-head. A number of fat calves were disposed of from £3 up to £4 15s. a-head.

DARKEITH.—The show of cattle was first-class, thirty of them averaging £22 5s. The highest priced bullocks brought from £20 to £25 10s.; middling sorts from £14 to £17 10s.; a lot of small queys averaged £10 15s.; a lot of rough hogs, 48s. 6d. to 49s. 3d.; a lot of clipped do., 41s. to 43s.; a lot of do. do., 31s. 9d. to 36s. 6d.; a lot of store hogs, 32s., the best lambs brought from 29s. to 34s. 3d.; smaller sorts from 17s. to 26s.; calves brought from 14s. to 37s. 6d. **EAST-LOTHIAN.**—Best class of bullocks sold from £20 to £26 10s., smaller sorts from £14 to £19, grazing two-year-olds from £13 to £14 10s., storks from £8 to £12 2s., milch cows from £8 15s. to £14 15s., fat calves from 34s. to 79s., and store do. from 12s. to 25s. The following are the average prices of the different lots of sheep:—Fat lambs, 26s., 24s., 31s., 28s. 6d., 30s. 3d., and 26s. 3d.; half-bred clipped hogs, 36s. 9d., 41s. 6d., 39s. 6d., 42s. 3d., 36s. 6d., and 37s. 6d.; rough do., 63s. and 58s.; clipped Southdown ewes, 46s. 6d.; do. bred tup, 56s. 6d. and 52s. 6d.; rough do., 55s., 67s., 66s., and 78s.; blackfaced eild ewes, 27s. 3d.; do. tops, 31s. and 34s.; greyfaced store hogs, 33s.; and pigs sold from 30s. to 50s. a-head. The supply of store cattle and half-bred hogs was not equal to the demand.

THE BARK SEASON.—RETFORD.—The quality of the article this year is extremely good, and more stringent than it has been for several years past. The fall of timber (especially oak) has been a large one here, and, consequently, the article will keep for years. But its price is, nevertheless, rather higher than last year—say, from £4 15s. to £5 per ton, and at which there is a capital demand.

A farmer near Dorchester has now the enormous number of 3,000 pigs. He breeds and purchases to keep up his stock. One week he bought 600 pigs.

THE ALPACA IN AUSTRALIA.—The last accounts from Avst alia state that all the hopes which had been entertained of the naturalisation of the Peruvian alpaca have been disappointed. Of the 300 introduced by Mr Ledger from Peru, five years ago, and purchased by the Government of New South Wales for £15,000, the whole have died off, and their progeny, numbering 330, are in an unhealthy condition.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MAY.

The advices at hand from nearly all parts of England, in reference to the appearance of the wheat crop, are very favourable. Although the weather has been very changeable, and although at one time great heat prevailed, both the winter and spring-sown wheats have progressed well, and, at present, they indicate a full average yield. The extent of land under culture is, we believe, quite equal to last season, notwithstanding the long continuance of low prices. Barley and most other descriptions of spring corn have come up remarkably well; but, on most of the light soils, they now require moisture.

The stocks of wheat in the hands of the growers are large for the time of year, and the demand for that description of produce is in an unsatisfactory state. Another heavy crop of wheat, however, could hardly reduce prices much beneath their present level, as we should have to import so much less grain to meet the consumption. At present, the supplies on passage from abroad are only moderate; but we understand that very large quantities continue to be held on the Continent and in the United States. At present, there is no profit on the import of breadstuffs from New York; but the low freights at which grain and flour are now carried, and the serious balance of trade against America, together with the difficulties surrounding the money question, so far as the value of gold is concerned, may lead to increased shipments during the remainder of the year. Our impression is, therefore, that we shall have wheat low in price for some time.

Unusually large supplies of potatoes have been on offer in the different markets, in, for the time of year, good condition. The demand for them has been in a depressed state, at from 25s. to 65s. per ton. In many instances, they have been purchased by the cowkeepers as low as 20s. per ton. At this time last year, the best old potatoes were worth 120s. to 140s. per ton. The new crop is looking well; but, as yet, very few new potatoes have been on sale. Continental advices are favourable as regards the appearance of the fields.

The public sales of Colonial wool now in progress in the metropolis are progressing steadily. The high range in the value of money has somewhat interfered with prices; nevertheless, up to this time, they have advanced 1d. to 2d. per lb., when compared with the previous prices; and it is understood that nearly the whole of the supply in warehouse will be disposed of. Foreign buyers have operated somewhat freely, and about 4,000 bales of Cape wool have been taken for shipment to New York.

There has been less doing in hay and straw, owing to the large quantity of grass in the fields, and prices have had a drooping tendency. Meadow hay is selling at from £2 10s. to £4 10s.; clover, £4 to £5 10s.; and straw £1 4s. to £1 10s. per load.

The hop bine has made considerable progress, and the accounts from most of the plantations are of a very favourable character. The bine is free from blight, and the prospect is that the growth this year will be a very large one. The quantity of hops on offer is only moderate; yet the demand is in a very inactive state, at from 65s. to 180s. per cwt. The imports from abroad have almost wholly ceased. We presume, therefore, that the stocks abroad are now almost wholly exhausted; but we understand that additional tracts of land have been laid down for hops both in America and Germany.

The English wool trade still continues unusually active, and prices show a tendency to improve. In some parts of the country 2s. 7d. per lb. has been realised for fine qualities, and speculative buyers have been unable to purchase adequate supplies. The great prosperity of the woollen trade, the continuance of the terrible struggle in America, and the reduction in the Bank rate for money to 7 per cent. together with the active demand for cotton, must have considerable influence upon the value of wool for some time. According to the present rate of consumption, the whole of the new clip of English will be used up within three or four months from this time. Colonial and foreign wools are, therefore, likely to rule higher in price, notwithstanding

that large supplies are still on passage for the time of year, and that the clip, both in Australia and at the Cape, has been a very large one.

The grain trade in Scotland has continued in a very inactive state. On the whole, however, prices have been fairly supported. The stock of wheat as well as of spring corn appears to be much reduced; yet dealers generally have operated for immediate wants only.

In Ireland, very little movement has taken place in the value of any kind of produce. The trade has been in a very inactive state, and the prices current in the previous week have been with difficulty supported. The shipments to England have been on a limited scale. Indian corn, although the imports from America have fallen off considerably, has commanded very little attention, at low currencies; but the great abundance of the potato crop has greatly interfered with the value of maize.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Although most of our markets have been seasonably well supplied with beast, chiefly in prime condition, the demand for nearly all breeds has been moderately active, and, on the whole, prices have continued steady. The arrivals from Norfolk, Suffolk, and Scotland into London have, if anything, been superior to many previous seasons, and, for the most part, they have fattened rapidly. Had it not been for the fine condition in which the stock has made its appearance, prime meat, taking into consideration the immense consumption going on, would have commanded unusually high rates. The supplies of sheep have exceeded the previous month; but there has been a further improvement in their general quality. Nevertheless, the mutton trade has continued somewhat active, and really prime Downs and half-breeds, out of the wool, have found buyers, at 5s. 4d. per 8lbs. We may remark that both beasts and sheep have come to hand much less diseased than formerly, and that very few cases of rot have come under our observation. Lambs have been selling remarkably well—viz., from 6s. 4d. to 7s. 8d. per 8lbs., and most of the butchers state that they "die" remarkably well. The veal trade has been devoid of animation. In prices, however, very little change has taken place. The pork trade has been heavy, at unaltered quotations.

In most parts of the country, the supply of grass in the pastures is very large—considerably in excess of last year—and a heavy crop of hay is pretty generally anticipated. The quantity of old hay in stock is now very moderate.

The imports of foreign stock into London have been on a full average scale; but there has been a falling off in the weight and quality of the beasts and sheep from Holland. The returns for the Metropolis only are as follows:

	HEAD.
Beasts	5,665
Sheep and Lambs	16,523
Calves	1,782
Pigs	4,852
Total	28,822
Same time in 1863	22,161
" 1862	11,206
" 1861	18,978
" 1860	18,910
" 1859	10,718
" 1858	6,708
" 1857	7,343
" 1856	3,556
" 1855	7,103
" 1854	4,703
" 1853	18,007
" 1852	8,504

The above comparison shows that the import trade in foreign stock continues to increase. And yet, prices are still high, considering the steady production in this country. We have, however, less competition on the part of the Irish graziers; but the diminished supplies from Ireland are fully made good by Holland, Germany, &c.

The total supplies of stock, including the foreign arrivals, exhibited in the Great Metropolitan Market were:—

	HEAD.	
Beasts..	23,240
Cows	584
Sheep and Lambs	122,210
Calves	2,063
Pigs	3,080

COMPARISON OF SUPPLIES.

May.	Beasts.	Cows.	and Lambs.	Calves.	Pigs.
1863.....	20,444	538	126,040	2,129	3,120
1862.....	19,273	510	132,450	1,527	3,022
1861.....	19,500	500	113,750	1,178	2,950
1860.....	19,040	543	124,580	2,059	2,920
1859.....	17,990	482	113,512	1,012	2,360
1858.....	18,722	480	115,886	1,671	2,760
1857.....	18,741	450	104,990	1,415	2,530
1856.....	18,722	495	119,640	1,260	2,545
1855.....	19,847	410	113,600	2,470	2,590
1854.....	20,831	576	124,824	3,146	2,435

The comparison of the arrivals of English, Scotch, and Irish beasts stands thus:—

	May, 1862.	1863.	1864.
Norfolk, Suffolk, Essex, and Cambridgeshire ..	12,900	12,820	11,520
Other parts of England	3,000	1,650	2,900
Scotland	1,984	1,430	1,735
Ireland	90	78	520

Beef has sold at from 3s. 4d. to 5s., mutton 3s. 6d. to 5s. 4d., lamb 6s. 4d. to 7s. 8d., veal 4s. 2d. to 5s. 4d., and pork 3s. 6d. to 4s. 6d. per 8lbs., to sink the calf.

COMPARISON OF PRICES.

	May, 1860.		May, 1861.	
	s. d.	s. d.	s. d.	s. d.
Beef..... from	3 6	to 5 6	3 4	to 5 0
Mutton	4 0	to 6 6	3 6	to 5 6
Lamb	5 8	to 8 0	5 8	to 7 4
Veal	4 0	to 6 6	4 4	to 5 4
Pork	4 0	to 5 4	4 0	to 5 0
	May, 1862.		May, 1863.	
	s. d.	s. d.	s. d.	s. d.
Beef..... from	2 10	to 4 6	3 4	to 5 0
Mutton	3 4	to 4 10	3 6	to 4 10
Lamb	5 8	to 8 0	5 4	to 7 4
Veal	4 2	to 5 2	4 0	to 5 0
Pork	3 8	to 4 10	3 4	to 4 6

Owing to the prevailing hot weather, the supplies of meat on sale in Newgate and Leadenhall have been only moderate. The trade, however, has been by no means active, and the quotations have fluctuated to some extent. Beef may be quoted at from 3s. 2d. to 4s. 2d., mutton 3s. 6d. to 5s., lamb 5s. 8d to 7s., veal 3s. 8d., to 4s. 8d., and pork 3s. 2d. to 4s. 6d. per 8lbs. by the carcase.

WEALD OF KENT.

The weather during the past month has been all that could be desired for agricultural work incidental to this season of the year, and the spring sowing concluded under the most favourable auspices. The ground, which was in want of rain, has received some very refreshing showers, and its effect has been most beneficial, imparting a stimulus to vegetation, such as is seldom witnessed in so short space of time, and enabling us to report the growing crops to be, on the whole, favourable. The pastures are now doing well, and, with warm nights, an abundant yield may be anticipated. The hop poling is now finished, and the tyers find it hard work to keep pace with the growth of the bine; in many places it is very strong, but some are backward and weak; fly has made its appearance, and as many as five to six on a single leaf have been found. The corn markets have been tending downwards, with but slight symptoms of reaction. The stock on hand is larger than for many years past, at this period.—May 18.

SOMERSETSHIRE.

Except the progress of the crops there is little to notice; but that is, perhaps, of as much importance as any subject for a report. This season is rather over an average as to earliness: rain is rather wanted; but, with this exception, the farmers say the weather is everything they could wish. Hay has been saved by cattle being turned to grass earlier by two weeks than last year. Our pastures, that are liable to be trodden to their injury, never suffered less from this, that we can remember. The effect of this fine season on the corn is that the wheat looks healthy, although perhaps not quite so well planted as in some springs, but there are exceptions. Winter beans are rather thin, but in fine bloom; spring beans come up nicely, and have grown well. Oats and barley have come up very well; indeed are forward, and very promising. A large breadth of barley has gone in. Wheat appears to be less than an average; while the growth of flax has increased threefold in comparison with some years since. Mangel is now being cropped; and some considerable quantity is likely to be grown. Vetches have not been very good. The clover and other artificial grasses are looking well, and will be fit for the scythe in a fortnight. A more general and finer apple-blossom has not been witnessed for years, with every prospect of fruit. Pears are growing fast. Altogether the country seldom or ever was looking so beautiful, and at present there is a good prospect of prolific crops. The early and abundant keep has had the effect of sending over high the price of poor stock, sheep especially: one-year-old hogs, which the writer has known at this season to be sold for £1, have this year reached £3 per head; those engaged in the trade consider this as about the highest price on record; as for sheep in general, if the wool does not sell over 2s. per lb., and the mutton 9d., there will be little for grazing. There has not been an equal advance in fat stock, although there continues to be a good sale: it has rather improved, but not equal to sheep. Pigs are considered higher than they have been known, except from some exceptional cause; at about six or eight weeks old they are worth £1. Wheat has lately been a better sale, but the advance on the best is scarcely 1s. per qr., and in a few instances 1s. to 2s.; the best white realized but 5s. to 5s. 1d. per 62lbs., as about the general sum; red 4s. 9d. per 62 to 63 lbs., and 4s 11d. to 5s. 1½d. per 64 to 65 lbs.; prime red and nurseries flour 27s. 6d., new 28s. to 28s. 6d. per sack; millers stand out for 28s., but this is more than was realized, except on long credit. Beans and oats have about kept their former value. Cheese is higher, and scarce on offer. The price of wool is nominal; asking prices are 2s. to 2s. 3d., and even higher.—May 18.

HEREFORDSHIRE.

On the whole, we think we never saw this fertile and beautiful county looking more charming than it does at the present moment. The extensive orchards of apple trees, or solitary hedge-row fruit trees, all abound with a superb blossom—the pear trees have dropped their bloom, and present a mass of healthy fruit. The hops are rapidly climbing the poles. The wheat plant generally looks well, and the same may be said of all the cereals. Then, as regards the fallows, they were never in a more healthy, clean, and forward state, where proper attention has been paid to their cultivation. The clovers are perhaps the only unfavourable crop, and many an acre has been ploughed up. This plant year by year gives us more and more uneasiness, from its continued failures, and valuable indeed would that information prove which would ensure us a good crop. Our pastures are much in need of rest, particularly where they have been spring grazed. The general fall of lambs has been good, and a healthy good clip of wool, combined with high prices for wool and meat, will help many of us to drag on an existence obtained from the capital we have invested in the cultivation of the soil, which the ruinously low price of corn would otherwise deprive us of. We have perused with much pleasure the excellent "Essay on Cider-making," written by Mr. Cadle, and published in the Royal Agricultural Journal, and consider it not only well worthy the prize awarded it, but containing much valuable and plainly-written information for the guidance of our cider makers. We therefore hope its circulation will not be confined

to the pages of the Journal in which it appears. The "all reds" will have to meet the "red with white faces" upon their own ground in 1865.—May 13.

NORTH NORTHUMBERLAND.

In taking a very brief retrospect of the last month (April), our remarks for this northern district report weather changeable, with many days wintery, caused by cold, sterile, easterly winds; vegetation making little progress, the turnip crop, on many large occupancies, nearly used up; store sheep and cattle had been picking for subsistence. Occasional frosty mornings, with flights of snow, proved rather trying among the hill-flocks, during the usual lambing season; the ewes being generally poor in condition, considerable loss has been the result, and it is expected a less than an average of lambs will be counted at weaning day. On our best in-field holdings, where Border Leicesters are reared, flocks being kindlier nursed during winter months, the cast of lambs vary from abundant to less; and we may, however, calculate about a medium. Since the advent of the present month the weather has produced a most agreeable change in rural aspects; from the 4th to the 6th we had thunder, with heavy falls of hail and rain—in some localities perfect deluges of the wintry element; again, on the 17th and 18th, the heat was very great, with thunder and partial rainfall; yesterday, a dense fog, with close, warm atmosphere; from midnight until 9 a. m. this day, great heat, with continual vivid glares of lightning, and thunder rolling in every quarter; yet in the locality from which we write only a few drops of rain have fallen, and, although a little cloudy, the sun shines out at intervals; two weeks ago fields of winter-sown wheat, that made no progress for several weeks previously, are now covering the soil with a full leaf and fine dark, green colour; all spring corn looks well for a full bulk. On the other hand, swede sowing, which in ordinary seasons is generally well over by the 20th, is barely begun on many large tillage farms. Land is difficult to work into mould for turnip culture. Potato planting was decently completed in the field in April, a less breadth being planted than last season, the produce of which was most abundant; the tuber has kept better, and has been sold at less per ton than for many years back; thousands of tons on the borders of the Tweed being consumed by cattle, pigs, and horses. Last year's corn crop has now been well tested on the barn floor, which has proved good in quality, and produces generally satisfactory in quantity; price per qr. only so-and-so; other grain a fair yield, quality also good, and cheap to the consumer. Fat beef and mutton has been the principal mainstay of the grazing farmer. Wool of good quality commanding a price above what we have ever known. Sales of live stock have generally gone off well for the vendor this May term. Competition for farms keep up rents, that leave a bare competency for the occupier's working expenses: poor-rate, management, highway agitation, their several establishment charges, blue-coat police, with trouble and expense of attending meetings to check misrule, are now costing the tenant farmer a large per-centage.—May 20.

HAMPSHIRE AND THE ISLE OF WIGHT, MAY 18.—A correspondent observes: "Everything looks remarkably well, both in the field, the orchard, and the garden. We have certainly not witnessed so genial a spring—such an absence of late frosts, of blight, and of caterpillars—for several years. We have had an unusually high thermometer for May: yesterday, at Newport, it was at 112 degs. in the sun. We have, indeed, reason to be grateful.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ABERYSTWYTH FAIR was on the whole very brisk, a great number exchanging hands at a considerably advanced rate. Some of the cattle were in good condition, as also the horses. There was an unusually large attendance of dealers.

ALCESTER FAIR was a very small one. There were a

considerable number of dealers present, and the small quantity of stock for sale went off pretty well. Mutton 6½d. to 7d., beef 6½d. to 7½d. per lb.

BANBURY FAIR.—An average supply both of beasts and sheep, beef properly so called being, however, scarce. Beef made from 4s. to 4s. 8d., and mutton from 4s. 6d. to 5s. 2d. the 8lbs.

BROMYARD FAIR.—Small supply of stock. Cows, Calves, and barrens were in request and sold well, and all on offer were speedily disposed of. Ewes and lambs, as well as pigs, also brought high prices. There were very few horses in the fair, and little or no business was done.

BUCKINGHAM FAIR happening so quickly after the last fair held here, the show of cows, heifers, calves, and store beasts was considerably less than on other Whit Thursdays; yet there was a good show, for which trade was good, at high prices, for every description of store beasts. The demand for cows and heifers in calf was brisk, through the abundance of green feed and the splendid fine weather, graziers coming out of the cheese districts to purchase a good number, going into Leicestershire and Derbyshire. Calves for the grazing districts around London found many buyers. Barren cows and small store beasts were also in fair demand. Prices ran as follows: best cows in full profit made from £19 to £21 per beast, small from £17 to £18, heifers at from £15 to £16, barren cows £14 to £15, steers £10 to £12, calves (weaned) 30s. to 60s. Some fine Oxfordshire and Southdowns were penned, as well as a fair show of half-breeds, many without their fleeces, some still unborn. The prices asked were very high, through the top price given for wool. Best tegs in their wool made from 50s. to 60s. each, out of do. 35s. to 45s., couples from 65s. to 70s., lambs from 14s. to 20s. each. Fat wethers from 7d. to 8d. per lb., fat lambs 9½d. to 10½d. Pigs were of slow sale, fat and lean; prices lower. Best fat porkers scarcely made 4s. per 8lbs. Store pigs at from 15s. to 20s. each, large do. 60s. to 60s. But few horses of good quality. Trade very dull, there being but few purchasers of inferior descriptions.

CAMBORNE FAIR was very thinly supplied with cattle. The greater number changed hands—lean cattle at about 4s. to 45s. per cwt.; fat cattle from £3 to £3 8s.; cows and calves from £3 5s. to £3 10s.

COUPER-ANGUS MARKET.—Notwithstanding the large supply, prices were good. Fat sold at from 9s. 6d. to 10s. per stone. Good milk cows £15, queys to calves £8 to £10. Cattle for the grass sold well.

DUN'S MUIR MARKET.—There was a large supply both of fat cattle and cattle for grazing. The attendance of buyers both from the locality and from the south was very good, but owing to the large supply of beasts in the market, and the unfavourable accounts from the south, the sales were very sluggish, and a number of animals were left unsold. The calving cows were well represented, and sold at prices similar to those of fat. Two years old ranged from £13 to £18, secondary from £9 to £12, yearlings brought from £5 to £9. Fat 9s. 6d. per stone, prime second 9s., and third 8s. 6d.

ELSTOW FAIR.—A moderate supply of stock of all descriptions. Trade quiet, at very high prices. Barren heifers and cows sold from £11 to £20; much cows, £14 to £22; beef very dear. Sheep in short supply, and trade slow. Ewes and lambs from 50s. to 70s.; tegs from 50s. to 75s.; mutton, 4s. 8d. to 5s. per 8lbs.

EVESHAM FAIR was one of the best, if not the best fair, ever experienced for quantity and quality of meat, and the great attendance of buyers. Beef realized 6d. to 7d. per lb., mutton 7d. Calves 58s. to 70s.

EXETER FAIR.—Best beef realized from 11s. to 12s. per score; inferior made from 10s. 6d. to 11s. Barreners met a slight decline; from 8s. to 8s. 6d. per score for the best, and 7s. 6d. to 8s. inferior. Cows and calves sold from £14 to £20. There were a few fat lambs, which brought 9d. per lb.

GLOUCESTER MONTHLY CATTLE MARKET was well supplied with beasts, and as these were supposed to be nearly the last of the stalled beasts for the season, the best quality met with a ready sale, but inferior could only be disposed of at lower rates. The mutton trade was good, and small sheep found a quick market. Lambs were scarce, and in great demand. Beef 6½d. to 7d., mutton 7d. to 7½d., lamb 9d. to 10d. per lb.

HEREFORD FAIR.—There was a tolerable supply of fat and store beasts, although rather fewer than at some of our

previous fairs at this season of the year. Buyers were plentiful, and a considerable business was done. Fat bullocks changed hands at 6d. to 6½d., and store beasts found purchasers readily at the prices asked at our market for the last two or three weeks. A large number of sheep and lambs were penned, all in excellent condition, and changed hands quickly at 6½d. to 7½d., according to weight. Pigs were plentiful, and rather dearer. A number of horses were on offer—some of good quality—for which high figures were asked and obtained.

IPSWICH FAIR.—The supply of stock and sheep was large, and the attendance was numerous. There were some good lots of fat bullocks, and the pens included a considerable number of fine lambs, though only a comparatively small number of sheep out of the wool. The prospect of feed being rather less promising than it was a fortnight since, trade was somewhat dull. Fat beef may be quoted at 7s. 6d. to 8s. per stone; mutton 7½d. to 8½d. per lb. out of the wool, and 10d. to 10½d. in the wool. Lambs ranged from £1 to £1 10s. per head, the finest ones only reaching the latter figure.

LEEK FAIR.—The show of stock was large, particularly of cows, which commanded high prices and ready sales. Of agricultural horses there was a fair supply, but the prices asked were generally high, while the demand was not so great.

LEICESTER FAIR.—The supply of store beasts was very limited—indeed, the show was much smaller than in any of the preceding year's fairs. This falling-off is attributed to a plentiful supply of grass, which caused dealers to hold back their stock. Prices were very high, and at the opening of the fair exorbitant demands were acceded to; but as the morning advanced buyers were tardy in their purchases, and trade was not so brisk. Milch cows £16 to £20, steers £10 to £13 each. The sheep market was only thinly supplied, and consisted only of store stock. Trade was good at the subjoined rates: Ewes with lambs 60s. to 75s., lamb hoggets 40s. to 60s. each. The horse fair presented a very meagre lot. There were, however, a few good things, and these sold well, at high prices. Inferior animals met with a very slow sale.

LEIGHTON BUZZARD FAIR was not so large as usual. Horses were chiefly agricultural, and heavy dray kinds, with some good nag and harness do.; trade dull, and prices on the decline. Messrs. Phipps, of Marsh Gibbon, Gibbard of Bloxham near Banbury, the Messrs. Smiths of Heath, and Reach and Wing being the chief dealers, selling first-rate horses; cart kinds made from £30 up to £40 each; best warranted four to six years old, fit for saddle or harness, sold at from £35 up to £50 each, cobs and ponies at from £14 to £18. Cattle: A small fair of fat cattle, there being but about half-a-score for sale; of lean beasts, cows, heifers, and calves, a moderate show; trade generally very slack, and prices showed a declining tendency. Fat beasts made 11s. 6d. the score. Store beasts three years old from £12 to £14 each, barren cows at from £13 to £15, two years old beasts from £8 to £10, sturks from £8 to £8, calves at from 30s. to 60s., best cows in full milk sold at from £18 to £20, second-rate ditto from £16 to £17, heifers at from £14 to £16. Sheep: A fair show of fat and lean sheep, some in their fleeces, others shorn; trade slack, the prices asked being extravagantly dear. Fat wether sheep without their wool made from 7d. to 7½d. per lb., in their wool from 8½d. to 9d. Fat lambs from 10d. to 11d. per lb. Best half-bred tegs sold at from 40s. to 50s. each, second-rate do. from 35s. to 38s., ewes (barren) from 40s. to 45s.; couples from 60s. to 70s.; weaned lambs at from 12s. to 20s. each. Pigs: A small show of both fat and lean; trade dull, the best of the weather causing fat pigs to be but in slight demand; small fat porkers made 4s. 4d. per 8lbs., large 4s.; small store pigs made from 18s. to 25s. each, large from 30s. to 50s.

LENTON (NOTTS) FAIR.—There was hardly an average show of cattle. The attendance of buyers was fair. The pastures being in good condition caused the demand to rule active, and full prices were paid. Milch cows sold at £16 to £20, store £8 to £15 per head. There was only a moderate show of horses, but good animals were scarce. A limited trade was done, but good prices were paid for the better sorts.

MELTON MOWBRAY FAIR.—There was a large attendance of buyers, but the supply of beasts was not quite equal to that of former years, and prices consequently ruled very high.

NEWARK FAIR was larger than usual. All kinds of

stock realized high prices; good drags cows very dear; fat beasts sold at from 8s. 6d. to 8s. 9d. per stone; one very fine specimen, bred by Earl Manvers, fetched 9s. per stone. The sheep market was very small indeed. Hogs 50s. to 60s., ewes and lambs 60s. to 70s., wethers 7d. per lb. The horse fair was quite as large as usual, with but few horses of superior quality.

NEWCASTLE FAIR.—There was a pretty good supply of stock, particularly of in-calf cows, which met with a quick sale. Good barrens realised 10s. more per head than at late fairs, and fat stock averaged from 6½d. to 7d. per lb. There was a large show of animals in the horse fair, which was particularly remarkable for a greater number of good waggon horses than has been exhibited for some time, but sales were by no means brisk. The pig market was well supplied, and here also business was slack.

RUTHIN FAIR.—The show of cattle on Friday was very small. Store pigs strong and small were in demand at an advance, but supply was meagre. Very little business in the horse fair.

SHEFFIELD FAIR.—The show of horses was numerous. A few useful draught horses were priced at £20 to £35 each. Two and three-year-olds were less in number than usual; and as to superior nags and carriage horses, it would indeed be a novelty to find any such at our fairs. The cattle market contained rather less than an average number of milch cows, and were chiefly of a secondary quality, but sold readily at £14 to £18 a head. A moderate trade was done in store pigs at advanced prices. A fair business was done in horned stock on the whole.

SHREWSBURY FAIR.—Trade was flat, owing, no doubt, to the heat of the weather, which was well calculated to affect the trade in meat. There was, however, a fair supply. Beef ranged from 6½d. to 7d. per lb., mutton from 7d. to 7½d.; lambs, 2s. to 3s. a head; bacon pigs, 5½d., and porkets 6d. per lb. Good cows and calves scarce and dear. Barrens and bullocks, as might have been expected from the abundance of grass, also sold well. Ewes and lambs 35s. to 75s., wethers 46s. to 52s.; store pigs dearer.

STEYNING MARKET was well supplied with every description of stock, the beef trade was not quite so brisk as the last market, and the prices realised were about 2d. per stone less than were then obtained. The mutton trade was brisk, and prices were well supported. The supply of lambs was small, and the prices ruled high. Calves were rather a dull trade, and lower rates were submitted to. Pigs sold readily at former prices. The best beef made 4s. 10d. per stone; wether mutton (as nearly all the sheep are out of the wool the price must be considered for shorn only) 5s. 4d. to 5s. 6d.; and ewes from 4s. 8d. to 5s.; the best lambs made from 7s. to 7s. 4d.; and calves from 4s. 2d. to 4s. 8d. per stone.

ST. IVES FAIR.—There was a large show of store beasts, but business was not very active, sellers demanding high prices, so that the trade was dull. Store sheep were in fair supply, the demand was rather active, and the late high rates were fully maintained. The show of horses was not so large as in previous years: good animals were very scarce, and sold at good prices. Second class animals were almost a drag, and low prices had to be submitted to in order to effect sales. Welsh ponies sold well.

TRURO FAIR.—The weather was very fine, and the attendance of farmers, dealers, and butchers was unusually large. There was a good supply of fat bullocks, in which there was a brisk sale at from £3 to £3 8s. per cwt.; they all changed hands. There was only a limited supply of store cattle, which proved unequal to the demand, and consequently all on offer were quickly bought up at from 45s. to 50s. There were very few Irish bullocks, but the supply was disposed of at improved prices, ranging from £9 to £14 per head. The demand for milch cows and in-calves was great, farmers in all parts of the county having splendid pasturage; the supply, however, was small. Only a few sheep on sale; shearlings sold readily at 6½d. There was a small supply of lambs; all were disposed of, and the prices ranged high. There was a tolerably good show of horses, and first-rate animals changed hands rapidly at capital prices; useful animals for saddle and harness were much in demand; inferior stock were unuseable.

WADEBRIDGE FAIR was but scantily supplied with cattle. Fat bullocks of good quality sold readily at three

guineas per cwt. There were several lots of shearing sheep in the pens, which sold at something over 6d. per lb. Sheep in the wool 8½d.

WARWICK FAIR.—There was but an indifferent show of stock. Mutton fetched from 6½d. to 7d., and beef about 7d. per lb.

YORK FAIR.—The show of horses and cattle was numerous, the former being only of an inferior class, and principally confined to roadsters and draught horses. Both these descriptions had ready sale, at high prices, when they were of average quality, but inferior ones hung heavily on hand, many remaining unsold. In the cattle market only lean ones were offered, and business was nearly confined to dealers.

IRISH FAIRS.—**CARRICK-ON-SUIR:** Milch cows £12 to £18, stores £8 12s, calves (yearlings) £4 to £6, two years old £6 to £10, and other stock in proportion. Bacon Pigs rated at 45s. per cwt.; bonhams of different ages brought high prices.—**CAVAN:** the demand for dry cattle was the greatest; indeed, sellers scarcely knew what price to ask for them; ten months' calves and yearlings selling freely from £4 10s. to £10 10s., and two years old heifers and bullocks at £7 10s. to £15 a head. Bacon or pork sold at from 41s. 6d. to 45s. per cwt. on the foot, sinking off.—**DUNLEER:** In the store cattle department higher prices were obtained than at any of the fairs held this year. Several lots of store heifers fetched £13 to £15 per head; two years old from £9 to £11, and yearlings in proportion. Two years old bullocks also brought enormous prices, and good yearling calves were in very eager request at astonishingly enhanced rates. Strip-pers were quickly bought up by graziers, from £9 to £14 per head. In the sheep fair the owners, in many cases, refused to take the prices offered for shearings. Wether Mutton (clip) may be quoted from 6½d. to 7½d., and ewe mutton (clip) from 5½d. to 6½d. per lb. In the swine department of the fair we had a very ample supply. The demand, however, was slow, even at reduced prices. Bacon did not sell so low since Christmas. Best quality may be quoted from 38s. to 42s. per 112 lbs.; store pigs were also rather slow of sale. Suckers and weanings were dear.—

CROSSAKIEL: Stores, both heifers and bullocks, as well as everything in the milk way, met a very animated demand, and were briskly bought up at an early hour in the day. Two-year-old heifers had willing buyers from £8 10s. to £10 per head, while yearlings readily commanded an average of £5 10s. per head. Calves were scarce, and exceedingly dear, being much looked after. Springers may be quoted £9 to £16 as an extreme figures. At **DRUMLISH** milch cows were in good demand, and sold from £9 to £12 10s. each, those of a second-class description went at from £7 10s. to £9 15s. per head. Fat cows and bullocks went at enormous prices, quite beyond the expectation of the most experienced judges of the day; the average prices obtained for some top lots were from £18 to £33, second class and inferior lots went as high as £14 to £16. Some lots of three-year-old heifers went at £12 10s. each; two-year-olds sold at from £8 to £11 per head; yearlings went as high as £5 10s. to £6 5s. The supply of sheep was moderate, but prices ranged high; good wether mutton sold for 6½d. to 7d. per lb., with a brisk demand. The pig fair was well stocked, but bacon hogs appeared to be greatly on the decline, some sold as low as £3 15s. per head, that could be sold some weeks ago at £5 10s. Stores were in good request, and sold as high as £3 10s. to £3 15s. per head. Young slips rated at from 34s. to 52s. each. **TEMPLEMORE:** Springers went from £18 to £17; two-year-old heifers, £10 to £12; bullocks, £12 to £14; yearlings, £6 to £7 10s.; fat cows, £16 to £20; hoggets fetched from 40s. to 55s.; fat sheep, 50s. to 60s. **LONGWOOD (Co. Meath):** Prices of young stock of every description maintained the late high prices. Three-year-old heifers readily fetched from £12 10s. to £14 10s. each; two-year-old do., from £9 to £12 per head; and yearlings, from £5 to £9 each. Young bullocks were sought after at high figures also, but they were rather scarce. Strippers brought from £9 to £13 each, and were all disposed of. In the milk department a very high value was set upon springers and dairy cows, and a general clearance was effected at prices varying from £10 to £18 each. Wether mutton (in wool) sold at 8½d. per lb., and in clip at 7d. per do. for the very primest lots; ewes in proportion. Lambs sold high. In the swine fair the supply was an ave-

rage. Bacon had a downward tendency, and numerous heavy pigs were bought for exportation. Store pigs and suckers sold at remunerative rates.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, May 23.—We note a slow trade in Butter at declining prices; the best fresh has fallen 1s. per dozen, and other sorts to nearly the same extent.

Dorset, fine	104s. to 106s. per cwt.
" middling	98s. to 98s.
Devon	100s. to 102s.
Fresh	9s. to 12s. per doz. lbs.

CORK BUTTER EXCHANGE, (Saturday last.)—The supplies this week averaged about 1,200 firkins daily, showing a steady increase in the quantity. The demand was not brisk, and prices had a declining tendency, and are likely to decline still more. Since Monday firsts fell from 100s. to 95s., seconds from 98s. to 94s., thirds from 89s. to 84s., and fourths from 88s. to 80s., fifths remaining at 69s. The supply of mild cured is increasing to about 40 firkins daily. On the week its price fell from 106s. to 98s. on firsts, from 102s. to 96s. on seconds, and from 98s. to 88s. on thirds.

GLASGOW.—The supply of cheese rather small, but equal to the demand; the heat of the weather checking business; about six tons passed the weigh-house scales; Dunlop 54s. to 63s., Cheddar made 62s. to 65s.; skim milk 23s. per cwt.

LEICESTER.—There was a very small pitch of cheese. The supply, however, was of excellent quality, and came to hand in first class condition. Business opened very brisk, but ultimately received a check, buyers holding back in consequence of the high rates demanded. Stiltons were a short supply, and in bad condition, which caused them to sell very slowly. Leicester stores, super quality 75s. to 82s. per cwt., inferior, which were a dull sale, 40s. to 46s. Stiltons ranged from 7d. to 10d. per lb. Only a few bad lots remained on hand late in the day.

SALISBURY.—There was a small supply, and trade ruled very heavily. A quantity of new skims was bought in, which realized from 18s. to 22s.

SHEFFIELD.—The supply of cheese appeared less than we have noticed for many years; prices, consequently, were high. Small thin cheese sold at 7d. to 7½d. per lb., and thick at 8d. to 9d. Notwithstanding these high prices, a good clearance of the best dairies was effected at an early hour.

HOP MARKET.

BOROUGH, MONDAY, May 23.—The genial weather of the last week has caused the bine to make unusual progress; and in every district the prospect is most promising. Some few fly have been found at Worcester and Farnham, but hardly sufficient to deserve notice. The market continues quiet, with a small consumptive demand, at prices a shade below our recent currency.

Mid and East Kents.....	120s., 140s., 180s.
Weald of Kents.....	112s., 132s., 140s.
Sussex.....	105s., 120s., 126s.
Americans.....	70s., 95s., 115s.
Bavarians.....	105s., 135s., 168s.

MAIDSTONE, May 19.—The present genial weather is effecting wonders in our hop plantations. The bine grows with great rapidity, and is of good strength and colour, fast running up the poles. We never remember the plant looking so well at this early period of the season, and should nothing arise to interrupt them, we shall look to grow "an end of hops." Some "who do know," already prognosticated a good top crop. There is as yet no vermin, or anything else to injure them.—*Sussex Express.*

THE HOP PLANTATIONS IN EAST KENT.—During the past week the hop gardens in this district have continued to improve. The plants, which are unusually free from insects, have grown so rapidly as to out-run the tyers. In some places, too, this work is being delayed through a scarcity of hands. Noted hop-growers assert that the prospects of a good crop were never more encouraging than at present.

EAST KENT.—CANTERBURY, May 22.—Finer weather or a more healthy or rapid growth could not be desired.

Tuesday, Wednesday, Thursday, and Friday were hotter than it has been known in May for many years. On Saturday morning a thunderstorm passed over the district, leaving the weather colder, and apparently unsettled; but yesterday afternoon and to-day have been fine and warm, though the temperature has not been so high as previously. This afternoon the wind has moved round from the north-west to south-east. Hot weather is best for the hops, which since last Monday have grown as much as from a foot to fifteen inches in twenty-four hours, for several days in succession. Such vigorous growth was hardly ever known, and the planters experience great difficulty in obtaining tyers. One planter writes that he has been obliged to take his farm-labourers from their ordinary work, and get them to assist the women in the hop grounds. A fortnight ago there were complaints of flea, but I have heard none during the last five or six days. It is when the growth of the bine is checked by easterly winds that the flea is most destructive; but when the growth is rapid the planters do not care much for flea, because, as they express it, the bine outruns the pest. Taking the entire district of East Kent, the plantations never looked better on the 22nd of May than they do to-day.

HOPS.—FRANCE: Hops have generally reflected little activity in the north of France. The growing crops are advancing satisfactorily, and will yield, if they continue to look as well as at present, an abundant crop. At Alost the last quotation was 88s. to 92s., at Bailen 90s. to 94s., and at Antwerp 88s. to 94s. per cwt.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, MONDAY, May 23.—During the past week the arrivals coastwise and by rail have been considerable for the season of the year, and owing to the extreme heat of the weather only a very few found buyers at any price, and all inferior or stale lots unsaleable. The following are this day's quotations, which are merely nominal.

Yorkshire Flukes	per ton	30s. to	50s.
" Regents		20s. to	30s.
" Seedlings		20s. to	30s.
" Rocks		20s. to	30s.
Dunbar Regents		35s. to	40s.
Perth, Forfar, and Fifeshire Regents		20s. to	30s.
" " Rocks		20s. to	30s.
" " Keds		25s. to	30s.

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, May 23.—For the time of year, the supplies of Potatoes on sale at these markets are large. The trade for nearly all qualities is dull, yet prices are without material change from last week. The imports from the Continent, last week, were very small.

Yorkshire Regents	50s. to	60s. per ton.
Ditto Flukes	50s. to	65s. "
Ditto Rocks	45s. to	50s. "
Ditto Seedlings	40s. to	50s. "
Scotch Regents	40s. to	50s. "
Ditto Rocks	35s. to	45s. "

WOOL MARKETS.

ENGLISH WOOL MARKETS.

CITY, MONDAY, May 23.—Although upwards of 100,000 lbs. of colonial Wool will be offered at the public sales now in progress, there is still rather an active inquiry for nearly all kinds of English Wool, and in some instances the quotations have further advanced 1d. per lb. The supplies on sale are very moderate.

CURRENT PRICES OF ENGLISH WOOL.	s.	d.	s.	d.
Fleeces.—Southdown hoggets	Per lb.	1 11/4	to	3 0/4
Half-bred ditto		2 4/4		3 6
Kent fleeces		2 0/4		3 1
Southern ewes and wethers		1 9		1 10
Leicester ditto		2 0		0 0
Soris.—Clothing		1 6		1 10
Combing		1 6		3 0/4
Superior Lincoln Hoggets		2 6		0 0

BRADFORD WOOL MARKET, (Thursday last).—The Whitesunday holidays have as usual interfered considerably with business during the week, and to-day there is not any large quantity of wool changing hands. The new wool brought to market is taken up at old rates, but we do not observe the

tendency to advance visible last week. In some quarters there is an expectation of a slight decline as soon as the new wool comes forward in larger quantities, but it is quite possible that a further reduction in the rate of discount would check any alteration in this direction.

YORK WOOL MARKET, May 19.—At this day's market (in addition to 30 sheets of Moor wool, which has been laying here since September last) we had about 160 sheets of the clip of 1884, all of which has been sold, except four sheets. Lustrated and bright-haired fleeces 2s. 4 1/2d. to 2s. 5 1/2d., as per quality and clean condition. We heard of 2s. 6d. per lb. being given in some instances, but it was understood there was "a return." Mixed, cross-bred, and ewe fleeces 2s., 2s. 1d., 2s. 2d., and 2s. 3d., as per count of hogg and ewe fleeces, quality and condition. These markets will be held weekly until further notice.—*Yorkshire Gazette.*

BRESLAU WOOL REPORT, May 20.—Business continues exceedingly brisk, with prices daily increasing. All descriptions are required, chiefly the finer ones, which are realising extreme rates. Transactions amounted to nearly 5,000 cwts., being the third part of our remaining stock. In the meantime very large purchases have been effected on the sheep's back, and at the present moment more than 12,000 cwts. have been contracted by home, Berlin, Netherland, and Hamburg speculators, at an advance of 4 to 6 thalers above last June fair quotations.—**GUNSBURG BROTHERS.**

WOOL.—FRANCE: Indigenous wool is wanted in French manufactories, and the approaching shearings are awaited rather impatiently. At Havre, Buenos Ayres wool in a dirty state has brought 1s. 1d. to 1s. 4d. per kilogramme (the fifteenth part of an English cwt.); La Plata 1s. 5 1/2d. to 1s. 10 1/2d.; Monte Videau, in a dirty state, 1s. 10 1/2d. to 2s.; La Plata sheep in hides 11 1/2d. to 1s. 2 1/2d., and Buenos Ayres ditto 1s. 4d. to 1s. 9 1/2d. At Marseilles white washed Mousoul has made 1s. 9 1/2d. to 2s. 8 1/2d., and Jumel 1s. 9 1/2d. to 2s. 8 1/2d., the whole at per kilogramme

MANURES.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano, direct from the importers' stores, or ex ship (30 tons) £12 5s. to £15 10s. per ton.
Bones, £5 to £5 5s.; crushed, £5 10s. per ton.
Animal Charcoal, (70 per cent. Phosphate) £5 per ton.
Coprolite, Cambridge, (in London) whole £3 5s. to £3 8s., ground £3 to £3 5s.; Suffolk, whole £1 18s. to £2, ground £3 10s. to £3 15s. per ton.
Nitrate of Soda, £15 10s. to £16 10s. per ton.
Sulphate of Ammonia, £14 10s. to £15 per ton.
Gypsum, 30s. per ton. Superphosphate of Lime, £5 to £5 5s. p. ton.
Sulphuric Acid, concentrated 1-848 1d. per lb., brown 1-718 9 1/2d.
Blood Manure, £8 5s. per ton. Dissolved Bones, £8 10s. per ton.
Limeless Cakes, best American, £18 10s. per ton, ditto £18 to £10 5s. per ton; English, £10. Rape Cake, £5 10s. per ton.
Cottonseed Cake, £5 10s. to £6 per ton.

**E. PURSER, London Manure Company,
116, Fenchurch Street, E.C.**

LIVERPOOL SEED AND GUANO, &c., MARKET.

(Saturday last).—Guano: import 1,900 tons of Howland's Island, with sales of Upper Peruvian at £5 12s. 6d. per ton. Nitrate of Soda continues in moderate demand; sales about 100 tons at 15s. 3d. to 16s. per cwt., according to quantity. Saltpetre: sale 2,100 bags Bombay at 34s. per cwt. 3.85 per cent. refraction, and 110 tons Bengal at 31s. to 37s. 6d. per cwt., at 8 1/2 to 2.60 per cent. Brimstone still dull; sales of best thirds at £7 10s. per ton. No change to report in Bone Ash. Linned has been quiet during the last week; the sales are 2,750 bags and pockets of Bombay at 63s. to 64s., chiefly at the former price. Rapessed: Trivial sales of brown Bombay at 50s. to 52s., and 200 pockets of Guzerat at 67s. 6d. per qr. Palm Nut Kernels, 60 tons sold £10 5s. to £11 per ton. Linned Oil Cakes: 462 bags of North American at £8 7s. 6d. per ton from the quay. No change to report in Tallow: the sales have been moderate, comprising first F.Y.C. at 43s., and N.A. at 38s. 6d. to 40s.

Guano, Peruvian £12 5s. to £15 10s.	Linned Oats, per ten—
Do. Upper do 5 10 0 0	Do. in brils. .. 0 0 0 0
Patagonian 0 0 0 0	Do. in brils. .. 0 0 0 0
Kooria Moorina .. 3 10 0 0	English
Bone Ash	Gomd. Oats, Decur. 7 0 0 0
Saltpetre, Bengal, 3 per cent. .. 0 0 0 0	Brimstone, 2d & 3d 7 10 0 0
Glaciated, new red, per cwt. .. 1 15 0 0	Nitr. of Soda, p. ct. 0 15 0 15
	Lined, Bomby, p. qr. 3 3 0 0
	Tallow, 1st F.Y.C. 2 3 0 0

**SAMUEL DOWNS AND Co., General Brokers,
Exchange Court, Liverpool,**

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

May, on the whole, was brilliant and summer-like, much beyond the average of seasons, with a sufficient fall of rain to put vigour into all vegetation. The grass, at one time looking so poor and backward, promises an early and abundant gathering. The wheat, that in places was getting yellow and sickly, has fully recovered. The light lands, that were thinned by the severe frosts, show a vigorous growth among the remaining plants, and the spring corn everywhere exhibits a rapid and healthy growth. Some cold has been experienced since the thunderstorm of the 18th; but should the heat again prevail, we may yet have an early harvest. Though the fruit trees were very full of bloom, we find the hot sun has brought a blight upon the apples, which may considerably diminish their yield. We have therefore nearly past the spring favourably for cereals, and should the blooming time be propitious, with the blessing of heaven a general abundance may be looked for. Last year's plentiful crop, from the smallness of foreign supplies, may now be considered as three-fourths consumed. Prices from the first have been unsatisfactory to growers, and should no rise take place before the next gathering, those who have waited longest will have fared the worst. But this will be very much their own fault if sales are pressed. The past month has very little varied, but that little has been against farmers, as shown by the lowest general averages—38s. 9d. per qr., published on the 12th. If we take the gross of last year's growth at twenty millions of quarters, there will now be only five millions left for the three months between now and harvest, and this at a consumption of two millions per month would leave us minus one million, and at the present rate of foreign imports not more is to be expected from abroad. We should then begin the new cereal year with only the new crop to depend on, whatever that crop may be. With prices so low, there is no doubt that a speculative movement would forthwith commence, but for the high rate of discount. Still, if Conference should break up unsatisfactorily, as seems very likely, and England be forced into hostilities by the pretensions of Germany, an immediate change must ensue; and, as America now only expects 70 per cent. of an average yield, our future supplies may be scantier than our present, and an advance of 10s. per qr. be permanently established. The weather has become fine in Europe, and trade in most places dull; but there is no port whence any shipments can be made to meet English prices. The following rates were recently current at the places named: Fine white wheat at Paris was worth 44s. per qr., Baltic red at Antwerp 44s. 9d., Ghirka 40s., high-mixed Polish at Amsterdam 48s. 6d., Friesland 39s.; fine wheat at Straubing 43s. 6d., at Cologne 45s., at Dantzic the best qualities were 40s. to 42s., native at Venice 52s., red Marks

at Hamburg 41s., Holstein 39s. per qr. Odesa prices were 29s. to 36s. 6d.; soft wheat at Algiers 42s. 6d., hard 35s. 6d. per qr. New York, with incessant fluctuations in the value of gold, has been tending downwards, from expected supplies since the opening of the navigation, the last quotations for Chicago spring wheat being about 31s. 6d. per 480 lbs., amber 33s. 6d.; white Michigan, medium quality, 37s. per qr. of 480 lbs.

The first Monday in London commenced on a small arrival of English wheat and a good one of foreign. Rather more samples were exhibited this morning on the Kentish and Essex stands than of late, and there was a better demand. Of this the Kentish factors availed themselves early, and obtained fully the previous Monday's terms; but those of Essex asking 1s. per qr. advance were checked in their sales, and were obliged on the following markets to accept former terms. The foreign trade was firm, both as respected cargoes in London and off the coast. The wheat trade in the country was more decidedly improved, and very many markets were 1s. per qr. dearer, Hull and Bristol making sales freely at the advance; but Birmingham, Ipswich, Stockton, and some other towns were only slightly in sellers' favour. Liverpool was up 2d. per cental on Tuesday, with a similar improvement on the Friday's market. Glasgow rose 1s. per qr.: but Edinburgh was only firm. The Irish markets were steady generally, Dublin being very firm.

Though the second Monday's returns showed a slightly increased English supply, the foreign was very small, and chiefly from New York. The market was again cheerful, with only a moderate show on the Essex and Kentish stands, part of which was sold at 1s. per qr. improvement, though some sales were made at unaltered prices. The better qualities of foreign were generally held higher, but there was not enough passing to establish any rise. With but few vessels reported off the coast, holders were asking full prices. This being the eventful week when Conference obtained a suspension of arms in Denmark, almost at its opening the upward tone of the country markets was lost, more especially as this decision was accompanied by the most brilliant weather. Birmingham, Bristol, Newark, Worksop, Manchester, and many of the later markets were all in favour of buyers; but at several places the influence of the London advance was felt, as at Spalding, Ipswich, Bourne, Gainsborough, Rugby, and St. Ives. Hull only maintained previous rates. Liverpool, on Tuesday, lost the former advance; and was again 3d. to 4d. per cental cheaper on Friday. In Scotland and Ireland little change was noted.

The returns of the third Monday showed moderate supplies, both English and foreign. Not many samples appeared this morning on the Essex and

Kentish stands; but the greater probabilities of peace and superb weather quite lowered the tone of the market. The condition of the English wheat being mostly fine, it found offers readily, but at 2s. per qr. below the previous rates: this reduction was at first declined, though as the day wore, sales were slowly made at 1s. to 2s. less than former prices. Foreign business was almost in suspense, and holders generally were ready to accept 1s. per qr. reduction. Arrivals off the coast being plentiful, sellers could make no way. This week there was a decided alteration in the country markets, Birmingham, Bourne, Gainsbro', Leeds, Lynn, Manchester, Melton Mowbray, Sheffield, Spalding, and many other towns, were fully 1s. per qr. down; Bury St. Edmonds, Market Rasen, Sleaford, with several more places, were 2s. per qr. cheaper. Liverpool was 2d. per cental cheaper on Tuesday, with a similar reduction at the closing market. Glasgow noted a decline of 1s. per qr., and Edinburgh of 1s. to 2s. per qr. Dublin and several Irish markets also reported great dulness, and some decline.

The fourth Monday opened on very small supplies, both English and foreign. But few samples were sent up this morning from Essex and Kent, and there being a contract out for 3,000 qrs., and the weather broken since Friday night's storm, contractors readily bought well-conditioned parcels at fully the prices of the previous Monday. The foreign trade was on a small scale; but holders were asking fully as much money as previously, and some sales in retail were made on those terms. In floating cargoes scarcely anything was doing.

The imports of wheat into London during the four weeks were 24,305 qrs. English, 37,118 qrs. foreign, against 12,528 qrs. English, 47,017 qrs. foreign, for the same period in 1863. The foreign imports into the kingdom for four weeks were 289,817 qrs. wheat, 314,072 cwt. Flour. The general averages began at 39s. 7d., and closed at 39s. 3d. Those for London commenced at 41s. 5d., and closed at 42s. 10d.

With the wheat trade heavy and weather generally warm, the flour trade has been very lifeless all through the month. Town millers have kept up the top price to 40s.; but should wheat remain low, we question whether they will be able to maintain this rate. Country sorts have almost invariably given way 1s. per sack, and with only one week's importation from New York, barrels have declined about 6d.; still fine qualities are scarce, and though extra State has sold at 21s. 9d., anything choice would yet bring 25s. per barrel. Norfolks ex ship have been selling at 26s. country households at 29s. to 30s. The importations into London during the four weeks were in country sorts 56,454 sacks, and 922 sacks 12,423 barrels foreign, against 61,936 sacks country, 903 sacks 22,939 barrels foreign, for the same period in 1863. The exports from London were 2,996 cwts. only.

Since the close of the malting season, the barley trade has had little interest. The English supplies have been very small, and the demand equally so; 36s. has now become an unsaleable price for the

heaviest. Very fine foreign has been sold at 26s., and Danube qualities for grinding, after some advance for retail quantities, have become procurable at 22s. 6d. per qr., weighing 50lbs. per bushel. As supplies, both English and foreign, are now diminishing, we do not expect grinding sorts to be cheaper. The imports into London for four weeks were—in English sorts 3,280 qrs., in foreign 11,476 qrs., against 2,177 qrs. English, 12,894 qrs. foreign in 1863.

Most of the large brewers having ceased buying malt, only a retail business has been passing, with prices nominally the same. Stocks are considered to be good.

The supplies of oats having been well kept up, this trade has relapsed into heaviness, and the advance of 6d. to 1s. per qr. noted in April has been lost. When prospects were less pacific it was thought supplies might be interfered with, but with the month's suspension of arms, and some hope that there will be no renewal of hostilities, buyers have been more retired; 40lbs. per bushel sweet oats on board ship may therefore again be procured at 18s. per qr.; and though stocks are not heavy, it is thought these, with the usual supplies, will last till the large Russian shipments appear. It will be seen that our home supplies, as the result of a good harvest, have been well kept up, and that both Scotland and Ireland have made good contributions. The imports for four weeks were—English 7,983 qrs. Scotch, 11,483 qrs., Irish 10,824 qrs., foreign 102,701 qrs., against 5,451 qrs. English, 77 qrs. Scotch, no Irish, and 147,558 qrs. for the same period last year. Should the sittings of Conference not end favourably, we expect an advance in this grain, and it can hardly be cheaper so late in the season, even if peace should be secured.

The scanty supplies of foreign beans have given some tone to the trade, and prices have advanced 1s. to 2s. per qr., the quality of our own growth being good. But at this period of the year there is no large consumption, and unless the Egyptian supplies greatly fall off, there does not appear much probability of an advance; Alexandrian are worth about 32s. per qr., and good mazagans about the same. The imports for four weeks were—2,861 qrs. English, 2,253 qrs. foreign, against 1,104 qrs. English, 4,697 qrs. foreign in 1863.

But little has been doing in peas. With almost no arrivals of home growth, and not much from foreign parts, rates have been fairly sustained; greys and foreign maples were worth 30s. to 31s., white boilers 35s. to 36s.; but for the latter there has been a very limited demand. The imports into London for four weeks were—326 qrs. English, 3,056 qrs. foreign, against 219 qrs. English, 2,720 qrs. foreign for the same period last year.

The supply of linseed has been very short, and prices, notwithstanding their height, well supported. Cakes have sold moderately well at unaltered rates.

The seed season being over, there has only been an occasional speculative inquiry for red cloverseed at 2s. to 3s. per cwt. above the lowest point; trefoil and white cloverseed have been neglected,

A demand for tares sprung up for France after there had been a fall of rain in that country, which produced a temporary rise of 3s. to 4s. per qr. on the good ones still left on hand here; but these were few in number, most having been forced off for feeding purposes. Canary seed has about maintained its value, and rapeseed, from the great destruction of the plants on the Continent, has been advancing, and may very likely be much dearer, as half the crop has been destroyed in some parts of France, Belgium, Holland, and Germany, from the extreme fluctuations of the winter.

COMPARATIVE AVERAGES—1864-63.

From last Friday's Gas. s. d.			From Gazette of 1863. s. d.		
Wheat	101521	qrs. 29 3	Wheat	85684	qrs. 46 3
Barley	11422	.. 29 9	Barley	5424	.. 24 5
Oats	6470	.. 19 8	Oats	8393	.. 21 11
Eye	4	.. 28 5	Eye	28	.. 23 7
Beans	4138	.. 34 3	Beans	3728	.. 28 3
Peas	496	.. 32 6	Peas	319	.. 35 8

FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT.

PRICE.	April 9.	April 16.	April 23.	April 30.	May 7.	May 14.
40s. 1d.
39s. 7d.
39s. 3d.
39s. 3d.
38s. 9d.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter.	
WHEAT, Essex and Kent, white	new 37 to 45	old 37 to 43
" "	red	" 36 40 .. 37 40
Norfolk, Lincoln, & Yorksh., red	" 36 40 .. 37 40	
BARLEY, new	22 to 28	Chevalier .. 28 26
Grinding	22 28	Distilling .. 28 28
MALT, Essex, Norfolk, and Suffolk	..	.. new 60 65
Kingston, Ware, and town-made	..	.. 60 65
Brown	..	.. 50 54
RYE, new	..	.. 29 30
OATS, English, feed 17 to 21	Potato ..	.. 30 32
Scotch, feed	18 21	Potato .. 19 23
Irish, feed, white 15	17	.. fine 19 21
Ditto, black, new 15	17	.. Potato, new 18 22
BEANS, Masagan .. 29	31	.. Ticks .. 29 31
Harrow .. 32	35	.. Pigeon .. 35 43
PEAS, white, boliers 26	37	.. Maple 24 to 26 Grey 29 30
FLOUR, per sack of 380 lbs., Town, Households	..	.. 32 40
Country	.. 25 to 27	.. Households .. 28 30
Norfolk and Suffolk, ex-ship	..	.. 24 26

MONTHLY RETURN.

An Account showing the quantities of Corn, Grain, Meal, and Flour imported into the United Kingdom, and admitted to Home Consumption, in the month of April, 1864.

Species of Corn, Grain, Meal, and Flour.	Imported from foreign Countries.		Imported from British Possessions out of Europe.		Total.
	Qrs. Bush.		Qrs. Bush.		
Wheat	328257	6	231	0	328488 6
Barley	126386	6	..	..	126386 6
Oats	122767	0	..	..	122767 0
Eye	7794	2	..	..	7794 2
Peas	6625	0	55	1	6680 1
Beans	11255	5	..	..	11255 5
Mais or Indian Corn	35131	4	..	..	35131 4
Buck Wheat	6	0	..	..	6 0
Bere or Bigg	1581	5	..	..	1581 5
Total of Corn and Grain	639804	4	286	1	640090 5
Wheat Meal and Flour	417855	2 21	595	1 17	418451 1 10
Barley Meal	..	..	1	0	1 0 0
Oat Meal	1	0 0	3	0 0	4 0 0
Eye Meal	12	1 0	..	..	12 1 0
Pea Meal	4	0 0	10	0 0	14 0 0
Bean Meal	19	0 0	..	..	19 0 0
Indian Meal	54	1 0	..	..	54 1 0
Buck Wheat Meal	2	1 0	..	..	2 1 0
Total of Meal and Flour	417948	2 21	609	1 17	418558 0 10

FOREIGN GRAIN.

	Shillings per Quarter.	
WHEAT, Danzig, mixed	45 to 49	old, extra 31 to 54
Konigsberg	.. 41 48	.. 48 50
Rostock	.. 43 46	.. fine 45 47
Silesian, red	.. 40 43	.. white 41 47
Pomera, Meckberg, and Uckermark, red	.. 41 44	
Danish and Holstein, red	.. 40 42	
Russian, hard 26 to 40	.. St. Petersburg and Riga 37 42	
French, none	.. Rhine and Belgium .. 41 44	
American, red winter 41 48, spring 40 41	white 44 47	
BARLEY, grinding	22 to 24	distilling and malting 25 27
OATS, Dutch, brew, and Poland	.. 17 to 22	.. feed .. 16 19
Danish and Swedish, feed	.. 17 to 20	.. Stralsund .. 17 20
Russian, Riga 19 to 20	.. Arch .. 19 to 20	.. P'sburg 19 21
BEANS, Friesland and Holstein	..	.. 20 24
Konigsberg	.. 20 to 24	.. Egyptian .. 20 22
PEAS, feeding and maple	.. 30 34	.. fine boliers .. 23 25
INDIAN CORN, white	.. 29 32	.. yellow .. 27 31
TARES, Spring 28s. to 34s. per qr.	.. large 42	.. Lentils 28 30
FLOUR, per sack	.. French 30 32	.. Spanish, per sack 31 32
American, per brl	.. 18 to 31	.. extra and dble .. 23 25

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS:	Wheat.		Barley.		Oats.		Eye.		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.
April 9, 1864	40 1	30 9	18 11	29 0	32 8	32 8	..	..	..	..	..	..
April 16, 1864	40 1	30 10	19 3	27 8	33 0	31 11	..	..	..	..	..	..
April 23, 1864	39 7	31 1	19 9	29 0	32 7	32 1	..	..	..	..	..	..
April 30, 1864	39 2	30 6	19 4	28 7	33 9	32 9	..	..	..	..	..	..
May 7, 1864	38 9	30 3	19 5	32 3	34 0	32 1	..	..	..	..	..	..
May 14, 1864	39 3	29 9	19 8	28 5	34 3	32 6	..	..	..	..	..	..
Aggregate Average	39 6	30 6	19 5	29 3	33 5	32 4	..	..	..	..	..	..
Same time last year	45 11	34 11	21 8	31 2	37 1	35 8	..	..	..	..	..	..

PRICES OF SEEDS.

LONDON, MONDAY, May 23.—The market for seeds remains inactive, without transactions passing. Trefoil meets inquiry, but with few samples offering.

BRITISH SEEDS.

MUSTARD, per bush., white	.. 9s. 6d. to 10s.
CORIANDER, per cwt.	.. 14s. 16s.
CANARY, per qr.	.. 50s. 55s.
TARES, winter, new, per bushel	.. 0s. 0s.
TREFOIL	.. 20s. 25s.
LINSEED, per qr., sowing—s. to 72s.	crushing 58s. 64s.
LINSEED CAKES, per ton	.. £9 10s. to £10 10s.
RAPESEED, per qr	.. 62s. to 65s.
RAPE CAKE, per ton	.. £5 10s. to £6 0s.

FOREIGN SEEDS.

CORIANDER, per cwt.	.. 16s. 18s.
CANARY	.. —s. —s.
TREFOIL	.. 20s. 24s.
CLOVERSEED, red 44s. to 50s., white	.. 50s. to 60s.
LINSEED, per qr., Baltic 58s. to 60s.	Bombay 60s. —s.
HEMPSEED, small —s. per qr., Dutch	.. —s. 42s.
LINSEED CAKE, per ton	.. £9 10s. to £11 0s.
RAPESEED, Dutch	.. —s. to —s.
RAPE CAKE, per ton	.. £5 0s. to £6 0s.

END OF VOLUME XLVI.

